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2018 WHOLESALE RATE CHANGE

Final Environmental Assessment

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EXECUTIVE SUMMARY

2018 Wholesale Rate Change Final Environmental Assessment

Proposed Decision and Need:

The Tennessee Valley Authority (TVA) is working with local power companies that distribute TVA power (LPCs) to change the rates LPCs pay for wholesale power. TVA wants to better align wholesale rates with underlying costs. In addition, TVA proposes changes to simplify the rate schedule language and improve processes for approving and publishing rates.

Changes to pricing structures and rates are proposed for two broad groups: wholesale Standard Service, which consists of residential and small commercial and industrial customers served by LPCs, and large commercial and manufacturing customers with power demands over 5,000 kW, which include customers served by LPCs and customers directly served by TVA.

The electric utility industry is facing competitive and technological changes that will impact the traditional electric utility business model through distributed generation, energy efficiency, technological advances, shifts in customer behavior, and regulatory requirements. This complex interplay of factors creates a need for self-funded electric utilities such as TVA to adjust their pricing structures and their management of generation and transmission assets. Identifying and appropriately apportioning costs of providing electric service is an important factor in equitably addressing this ongoing need.

In 2015, TVA, the Tennessee Valley Public Power Association (TVPPA) and the Tennessee Valley Industrial Committee (TVIC) commenced discussions to incrementally improve pricing signals and fixed cost recovery, as well as to encourage technology investment. The rate change TVA implemented in 2015 focused on better aligning pricing with underlying cost drivers. Since 2015, TVA has been discussing next steps with LPCs and directly served customers, and has now proposed a rate change that would be implemented beginning in 2018.

The primary objectives of this proposed rate change are to continue to improve the alignment of wholesale rates with their underlying costs to serve and to facilitate measured, managed changes in LPCs' retail rate structures. The proposed changes will reduce upward rate pressure by mitigating the effects of uneconomic development in distributed energy resources (DER). The intent is to implement changes concurrently at wholesale and retail and to enhance the fairness of the rate designs for both TVA and LPCs by diminishing cost shifting among consumers and among LPCs. The proposed changes will ensure that rates remain as low as feasible for all consumers, consistent with TVA's mission to serve and to improve the quality of life in the Valley.

TVA's current energy prices over-incentivize consumer installation of DER, leading to uneconomic results for the people of the Valley as a whole. Over the next decade, forecasted load is expected to be flat or declining, resulting in little need for new energy sources. At the same time, consumer interest in renewable energy continues to rise. The imbalance created by uneconomic DER investment means that costs are shifted to consumers throughout the Valley who cannot afford DER or otherwise do not choose to invest in DER.

TVA also proposes to lower energy rates for large general service customers. TVA cost of service analysis indicates that revenues collected from large general service consumers exceed the costs incurred by TVA to serve these consumers. Benchmarking studies place

Executive Summary

TVA in the 4th quartile for commercial rates. The marked inequity in large general service rate levels persuaded TVPPA and TVIC to agree with TVA's proposal to lower energy rates for large general service customers.

Description of Alternatives

In the Final EA, TVA considers five alternatives including a new alternative not included in the draft EA. The new alternative, Alternative C1, is TVA's preferred alternative and represents the rate change that TVA staff will recommend for adoption by the TVA Board.

Alternative A: No Action Alternative

Alternative B: Energy rate reduction and grid access charge (0.25¢/kWh)

Alternative C1: Energy rate reduction and grid access charge (0.5¢/kWh)

Alternative C2: Energy rate reduction and grid access charge (1¢/kWh)

Alternative D: Energy rate reduction and grid access charge (2.5¢/kWh)

None of the rate change alternatives under review in the EA would change the amount of revenue TVA collects. TVA proposes to make several other changes in rates, including:

1. Incorporating the environmental adjustment and other adjustments currently on the adjustment addendum into the base rates;
2. Moving all hydro allocation adjustments (credits to residential customers, debits to non-residential customers) from base rates to the appropriate adjustment addendum;
3. Decreasing Large General Service rates to move them closer to what it costs to serve those customers. Rates for Standard Service and Large Manufacturing Service will be increased slightly so that this change is revenue neutral;
4. Updating the power cost recovery components of LPCs' resale rates to account for changed Standard Service wholesale rates and changed hydro allocation adjustments;
5. Changing the fuel cost adjustment mechanism to administer the resource cost allocation to three rate classes instead of two rate classes;
6. Providing LPCs flexibility in their administration of the hydro allocation credits distributed to residential consumers;
7. Implementing a series of rate administration simplification initiatives to simplify business conducted through the rate schedules;
8. Updating ESS (Electricity Sales Statistics) reporting requirements.

TVA also proposes to rebalance the hydro allocation credits distributed to residential consumers with the hydro allocation debits collected from nonresidential consumers to reflect recent declines in commercial and industrial sales.

Under Alternatives C1, C2 and D, TVA would establish implementing guidelines for the proposed rate change for retail customers to ensure a gradual transition and minimize bill impacts.

What is the difference between a 'rate change' and a 'rate adjustment'?

A "rate change" is the process by which TVA changes the structure of the rates or the allocation of costs. Rate changes are designed to be revenue neutral to TVA.

A "rate adjustment" is the process by which TVA increases or decreases rates across the board to match revenue needs. A rate adjustment is not intended to be revenue neutral.

The proposed rate change would not affect the total revenue collected by TVA, but the allocation of revenues across customer classes and among LPCs would change slightly. If approved by the TVA Board of Directors, the rate change would be effective October 1, 2018.

Executive Summary

Public Involvement

TVA initiated the rate change process by sending letters to all LPCs on August 9, 2017. After the letter was issued, TVA met with LPCs to endeavor to reach agreement on the proposal. These meetings aided in scoping issues and alternatives considered for this EA, and they provided important stakeholder input to the process. In March 2018, TVA issued the draft EA for public review and comment. TVA received 1,741 comment submissions from the public and other stakeholders. Responses to substantive comments are addressed in Appendix D. TVA used this input when completing the final EA.

Summary of Environmental Impacts

TVA identified socioeconomics, energy use production and use, air resources, water resources, land use and waste as resources and issues potentially affected by this proposal. The assessment of potential impacts on the physical environment cannot be made with precision and involves some degree of speculation because the effects of the rate change on the physical environment depend on decisions made by intervening entities and consumers outside TVA's direct control.

Because of the limited magnitude of the direct and cumulative effect of the alternative rate structures, TVA expects that any induced environmental impacts would be indirect, limited, and essentially indiscernible. See Table ES-1 below.

TVA expects some minor socioeconomics impacts to result from all alternatives. Under Alternative A, cost shifting from DER participants to nonparticipants would continue and likely worsen over time. Higher retail energy rates would likely stimulate minor additional investment in DER compared to the current conditions, if all else is equal. However, this would increase the amount of cost shifting to nonparticipant consumers compared to current conditions. In contrast, Alternatives B, C1, C2, and D would avoid or lessen potential cost shifting while maintaining revenue neutrality. Under Alternative B, no change in the trend of DER adoption is expected, while under Alternatives C1, C2 and D, the rate of investment in DER may be slowed marginally because of a small increase in the payback period for DER investments. For existing DER investments where rates are specified by contract, the time for those investments to break even would not be affected.

TVA expects that under Alternative B (0.25¢/kWh), most LPCs would not change retail Standard Service rates. Therefore, there would be no to very limited effects on energy use or monthly bills at the retail level for Standard Service customers. Alternatives C1, C2 and D would have minor effects on energy use and monthly bills to Standard Service customers, with negative effects to some customers and positive effects to other customers. The proposed implementing guidelines established by TVA for the proposed rate change for retail customers under Alternatives C1, C2, and D would ensure a gradual transition and minimize bill impacts.

Across the alternatives, there would be a mix of minor negative and minor positive effects on households for all alternatives. Each alternative, including the no action alternative (Alternative A), has the potential to slightly increase the monthly bill for a majority of residential customers. Under Alternatives C1, C2, and D, for instance, high-usage households would likely see a decrease of more than 1.5 percent in their average monthly bills while low-usage households would likely see a small increase in their average monthly bills. Low-usage households' monthly bills would increase by a lower amount than moderate-use households. Impacts to low-income households, which likely span a variety of usage levels, would be more than other households as a proportion of household income.

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Under Alternatives C1, C2 and D, the average consumer (who uses about 1,250 kWh monthly) would experience a \$1 increase to their monthly electricity bill; the maximum increase in a consumer's monthly bill would be small, generally no more than \$2. Alternatives C1, C2 and D would likely have the beneficial effect of lowering households' bills in months of high usage (i.e., summer and winter), therefore helping to stabilize bills from fluctuations due to seasonal variation in weather. More stability is a benefit compared to less stability, all else equal. The greater stability of bills would be more beneficial for low-income households than other households, because higher peak bills due to season or weather are more likely to cause a problem in low-income households than for others. While the exact changes in Standard Service customers' monthly bills would vary by LPC, TVA projects that the changes would likely be similar across the entire TVA service area. Therefore, no particular minority or other socioeconomic group would bear a disproportionate share of negative effects. None of the alternatives would create environmental justice issues requiring mitigation, as no meaningful environmental or health effects would occur.

TVA expects minor positive effects to large commercial customers and minor negative effects to Standard Service and large manufacturing customers under Alternatives B, C1, C2 and D. Alternatives B, C1, C2 and D would lower rates for large commercial customers and make the rates more competitive. Rates for Standard Service and large manufacturing customers would increase, however, but remain competitive (see Appendix B for recent state, regional and national rate comparisons). Combined, these changes are expected to have negligible to minor economic effects on the TVA service area, including negligible changes in revenue and employment for existing firms.

Although economic impacts may vary slightly among the alternatives, there would generally be no variation in impacts to the environment among the alternatives. TVA found that none of the alternative rate changes is substantive enough to result in market responses and customer behavior changes that would require TVA to modify its power generation operations or to alter its power generation and transmission systems. Thus, there would be no discernible impacts to air resources, water resources, land use, or waste production resulting from implementing the alternative rate changes. Because of the absence or limited magnitude of the direct and cumulative effects of the alternative rate structures, TVA expects that any induced environmental impacts would be indirect and essentially indiscernible for any of the alternatives. The comprehensive environmental regulatory programs that exist throughout all of the Valley states would further ensure that any resulting environmental impacts are minor. The potential for derivative secondary impacts to resources such as cultural resources, floodplains, biological resources, endangered species, or wetlands would accordingly be highly unlikely.

Other than implementing guidelines that would be applied under Alternatives C1, C2 and D, TVA has not identified any additional mitigation measures necessary to offset or reduce the level of impacts of the alternatives.

TVA notes that Alternative C1 (0.5 cents per kWh) includes a rate change that falls within the range of reduction (0.25 to 2.5 cents per kWh) in the Standard Service energy rate alternatives considered in the Draft EA; in the Final EA, TVA found that impacts from Alternative C1 would be substantially the same as under Alternative C2.

CHAPTER 1 - PURPOSE OF AND NEED FOR ACTION

1.1 The Proposed Decision and Need

The Tennessee Valley Authority (TVA) is working in collaboration with local power companies that distribute TVA power (LPCs) to change the rates LPCs pay for wholesale power. TVA proposes to refine the structure of its wholesale electric power rates through pricing that better aligns wholesale rates with underlying costs.

In addition, TVA proposes several administrative changes associated with its rate structure, including simplifying the rate schedule language and improving processes for approving and publishing rates and rate-related documents (e.g. revising the Electric Sales Statistics (ESS) reporting requirements, revising the Outdoor Lighting rate schedule, and consolidating rate schedules for large customer classes).

The actions under consideration encompass changes to general pricing structures and rates for electricity and to certain administrative practices. Changes to pricing structures and rates are proposed for two broad groups: (1) wholesale Standard Service, which consists of residential and small commercial and industrial customers served by LPCs; and (2) large commercial and manufacturing customers with power demands over 5,000 kW, which include customers served by LPCs under Non-Standard Service provisions and customers directly served by TVA.

With rapidly advancing technology and increased consumer choices, the way TVA has priced electricity has also evolved. The current wholesale rate structure recovers costs on a volumetric basis, creating financial risks for consumers of TVA power by allowing costs to shift among LPCs and among end-use consumers.

The electric utility industry is facing competitive and technological changes. Those changes will impact the traditional electric utility business model through distributed generation, energy efficiency, technological advances, shifts in customer behavior, and regulatory requirements. This complex interplay of factors creates a need for self-funded electric utilities such as TVA to adjust their pricing structures and their management of generation and transmission assets. Identifying and appropriately apportioning costs of providing electric service is an important factor in equitably addressing this ongoing need. These costs vary by hour, by season, by customer class, and by customer usage profile.

In 2015, TVA, LPCs, the Tennessee Valley Public Power Association (TVPPA), and the Tennessee Valley Industrial Committee (TVIC) commenced discussions for incrementally improving pricing signals and fixed cost recovery, as well as encouraging technology investment. The rate change TVA implemented in 2015 focused on better aligning pricing with underlying cost drivers and was the first step in implementing this direction. TVA has been discussing next steps with LPCs and directly served customers and, in August 2017, issued a rate change letter to LPCs (see Appendix A), proposing to implement a rate change beginning in 2018.

The primary objectives of this proposed rate change are to better align wholesale rates with their underlying costs to serve and to facilitate measured, managed change for retail customers. TVA's energy prices in the current pricing structure over-incentivize consumer installation of distributed energy resources (DER) without a corresponding benefit in reducing

TVA's costs or the costs of other Valley consumers. Over the next decade, forecasted load is expected to be flat or even declining, resulting in little need for new energy sources. At the same time, consumer interest in DER continues to rise. The imbalance created by uneconomic¹ DER development means that TVA's and LPCs' costs are shifted to consumers throughout the Valley who cannot afford DER or otherwise do not choose to invest in DER.

TVA's proposal to implement such changes is consistent with guidance on rate design for DER issued by the National Association of Regulatory Utility Commissioners (NARUC) in 2016. In their guidance, NARUC recommended that utilities take action to address DER in rate design before DER becomes widespread:

Even at low levels of adoption, a jurisdiction should not be content to wait until adoption levels start to increase; planning for the future will enable a jurisdiction to have the tools in place when it is ready to act. Being proactive and maintaining awareness of customer adoption and behaviors will greatly alleviate the strain on a commission, utility, and stakeholders when it does come time to act. (NARUC, 2016; p. 7)

NARUC also urged utilities to establish appropriate price signals in rate design, stating that: "[I]f those price signals do not appropriately reflect a jurisdiction's policies on cost-causation, the result will likely be an economically and socially inefficient amount of DER." (p. 156) NARUC identified further specific benefits in the minimization of cross subsidies arising from DER:

Eliminating, or at least minimizing, the potential intra-class cross subsidies enjoyed by DER-owning customers has both efficiency implications and equity implications. If the cross subsidies are leading to uneconomic bypass (i.e., bypass that while decreasing costs for DER owners increases the overall cost to the general body of ratepayers), elimination of cross subsidies will increase economic efficiency. Reducing intra-class subsidies would minimize lower-income ratepayers from subsidizing higher-income ratepayers. (NARUC, 2016; p. 87)

NARUC's guidance also urges utilities to act now to resolve these challenging issues. The NARUC Manual states that the "economic pressures that DER may put on the utility and non-DER customers within a rate class is one of the most challenging issues facing regulators today." (p. 63) In addition to revenue erosion and cost recovery issues, NARUC cites "inter-class cost shifting apparent in traditional utility rate design" as a major issue (p. 63): "These issues have been driving . . . searches for alternate ways to treat DER in rate making." (p. 63) The NARUC Manual states that:

...under the traditional ratemaking model and commonly used rate design, if the utility passes its relevant threshold of DER adoption, the utility may face significant intra-class cost shifting and erosion of revenue in the short run. If left unaddressed, the utility could face pressures in the long term that might prevent it from recovering its sunk costs, which are necessary to provide adequate service. (NARUC, 2016; p. 67)

¹ TVA considers distributed energy resources (DER) to be "uneconomic" when the cost of energy derived from the DER is greater than the cost of the energy if provided by the local power company or directly by TVA. Installations may be "economic" for the individual or company that installs them but may be "uneconomic" for the Valley or other ratepayers.

The NARUC Manual admonishes jurisdictions not to wait until DER adoption rates are high before instituting corrective policies: "Each jurisdiction can start investigating and developing policies that best fit its jurisdiction. Current low adoption rates do not mean that a jurisdiction should wait; in fact, it is a perfect time to start its investigation." (p. 158)

The proposed changes are designed to improve pricing by better aligning TVA's wholesale rates with their underlying costs, consistent with TVA's strategic pricing plan. They also reduce upward rate pressure by mitigating the effects of uneconomic DER development. The intent is to implement changes concurrently, at wholesale and retail, and to enhance the fairness of the rate designs for both TVA and LPCs by diminishing cost shifting among consumers and among LPCs. The proposed changes would ensure that rates remain as low as feasible for all consumers, consistent with TVA's mission to serve and to improve the quality of life in the Valley.

Pursuing the rate change at this time would ensure a smooth transition for customers, which is preferred to taking a more aggressive action later to address an exacerbated problem which may require an aggressive change in rate structure. TVA's goal is to integrate the use of customer-owned DER but not at the expense of customers who cannot afford DER or who choose not to pursue DER.

TVA acknowledges that the current level of cost-shifting among residential DER to other consumers is estimated to be low. TVA estimates that current DER residential generation is approximately 0.2% of households growing at a rate of approximately \$5.4 million dollars annually in reduced revenue that must be collected from other consumers. TVA estimates that residential rooftop solar penetration is anticipated to grow over the next decade to 2% of residential households. Such DER penetration would equate to more than \$54 million dollars annually in shifted cost (2% of 4 million households is 80,000 households, assuming average sales of 2,500 kWh/monthly, with 30% of each such households' energy purchases bypassed with an average effective rate of \$0.10 and fuel cost of \$0.025 per kWh). Although residential rooftop solar is not the focus of the proposed wholesale rate change, those shifted costs over 10 years would result in over a half billion dollars in inequitably shifted costs.

Of greater immediate concern to TVA are costs shifted from commercial customers, as more commercial and industrial customers are taking on sustainability goals and committing to purchase up to 100% of their energy resources from renewable resources (e.g., RE100 participants), which under the current rate structure will unfairly shift costs to non-participants. While these commercial and industrial customers seek to increase the use of renewable resources, their facilities do not function as isolated energy islands, making it necessary for TVA and LPCs to supply them with power during times when their DER-based generation is not sufficient to supply their needs. The number of RE100 companies has more than doubled since TVA began the wholesale rate change discussions with our customers last year; most of those RE100 customers have locations within the TVA service area. Many of these commercial and industrial customers are among the nation's largest and most well-known companies, whose decisions to rely on renewable resources not entirely based on economics. Many of these companies have a presence through out the Tennessee Valley and are some of TVA's largest customers (see Table 1). In addition, many of these companies are now encouraging, if not requiring, their input suppliers to take on similar renewable commitments.

Table 1. Increasing Market Demand: Commercial and Industrial Renewable Energy Goals

Programs & Initiatives	Scope of Goals	Companies Participating
RE100 www.there100.org	Commitments to 100% renewable electricity	Over 131 companies to date, including Walmart, Starbucks, Google, IKEA, Nestle, Mars, Bank of America, Unilever, P&G, General Motors, Phillips, and Fifth Third Bank
Stated Renewable Energy Goals	Publicly stated renewable energy goals but no RE100 commitment	Companies include Amazon, 3M, Caterpillar, Waste Management, Dow, and Cargill
Business Renewables Center www.businessrenewables.org	Commitments to accelerating procurement of wind and utility-scale solar energy	Over 230 member companies, including FedEx, Best Buy, Cummins, Sprint, GM, Lockheed Martin, Marriott, Kaiser Permanente, Raytheon, Mars Incorporated, and Johnson and Johnson
REBA (Renewable Energy Buyers Alliance) www.rebuyers.org	Goal of growing corporate demand for renewables	Companies include Target, McDonalds, Hilton Worldwide, Nestle, 3M, DuPont, and Unilever

Figure 1 further illustrates the extent to which many companies are adopting DER. The figure identifies recent corporate solar market activities of 25 major companies, many of them present in the TVA service Area.

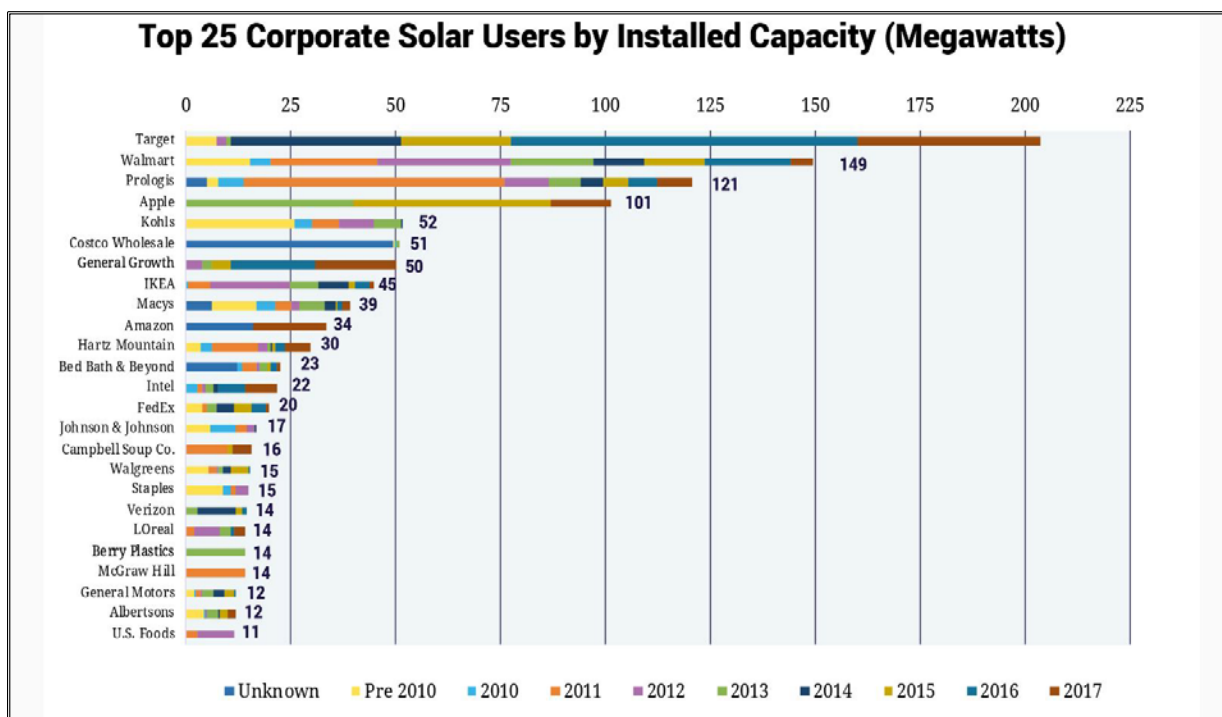


Figure 1. Corporate Solar Market Activity 2017. Copied from SEIA Solar Means Business 2017 Report.

The emerging growth in corporate and industrial demand for renewable energy has potential to further increase cost-shifting. TVA forecasters estimate that corporate renewable energy and carbon emissions reductions goals will greatly increase demand for renewable energy by 2020.

Figure 2 below represents the amount of “behind-the-meter generation” that exists today in the TVA service territory. Behind-the-meter generation power from an onsite generation resource that displaces generation services which would otherwise be provided from the local utility. To the extent that behind-the-meter generation displaces generation which would otherwise be sourced from the local utility, there can be cost shifting if fixed costs are being collected through those volumetric rates for demand and energy. TVA has documented approximately 700 MW of currently installed behind-the-meter generation from gas-fired generators (CT), Combined Heat and Power (CHP) plants, and solar installations. The current cost-shifting is estimated to be around \$50 million, using conservative assumptions for energy production (18% of available capacity), a relatively low effective rate (7.5 cents per kWh), and a fuel rate of 2.5 cents. This rate of cost-shifting would result in over \$300 million of unfair cost shifting by 2025.

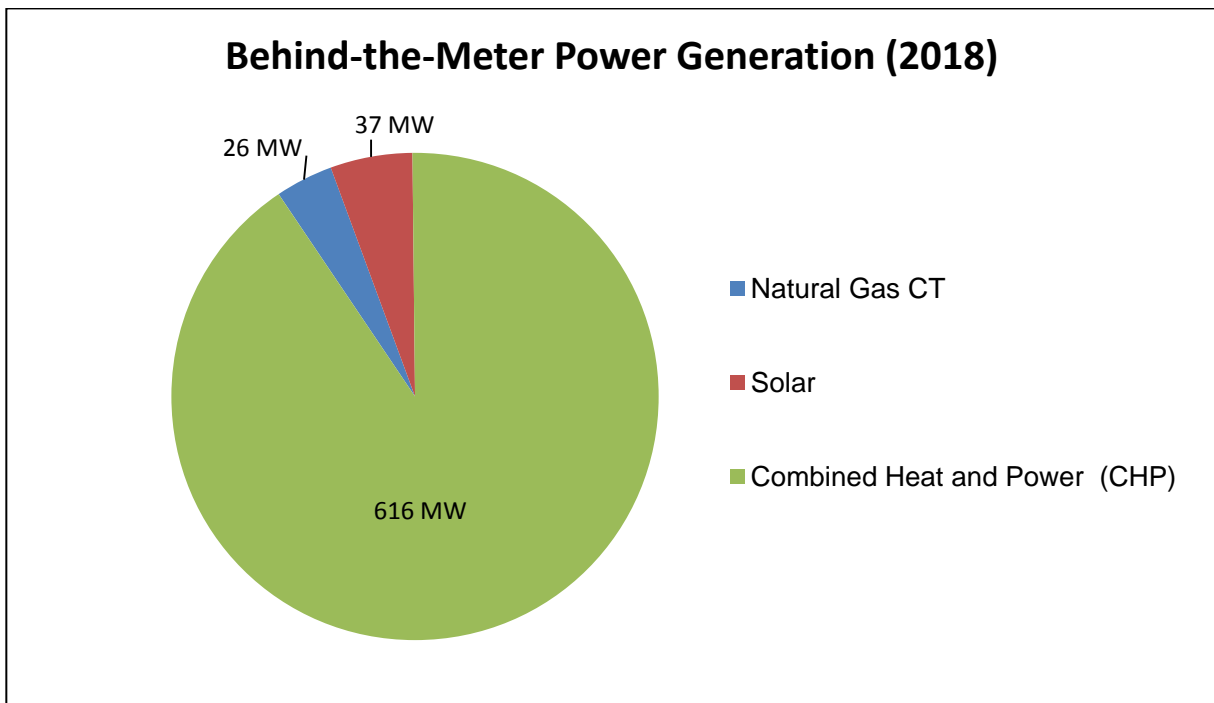


Figure 2. Behind-the-Meter Power Generation in the TVA Service Area (2018)

In the future, TVA anticipates additional growth in behind-the-meter generation. Figure 3 below represents the forecast for behind-the-meter solar generation in the residential and commercial sector. Behind-the-meter solar generation for the residential and commercial sectors is forecasted to double approximately every ten years. This would suggest that there would be approximately 500 MW of behind-the-meter solar generation in 2025. This trend in the growth of residential and commercial solar would result in an additional \$372 million in shifted cost by 2025. TVA believes, as NARUC stated in its Manual, that the best time to start making changes is when the penetration has not exceeded threshold levels.

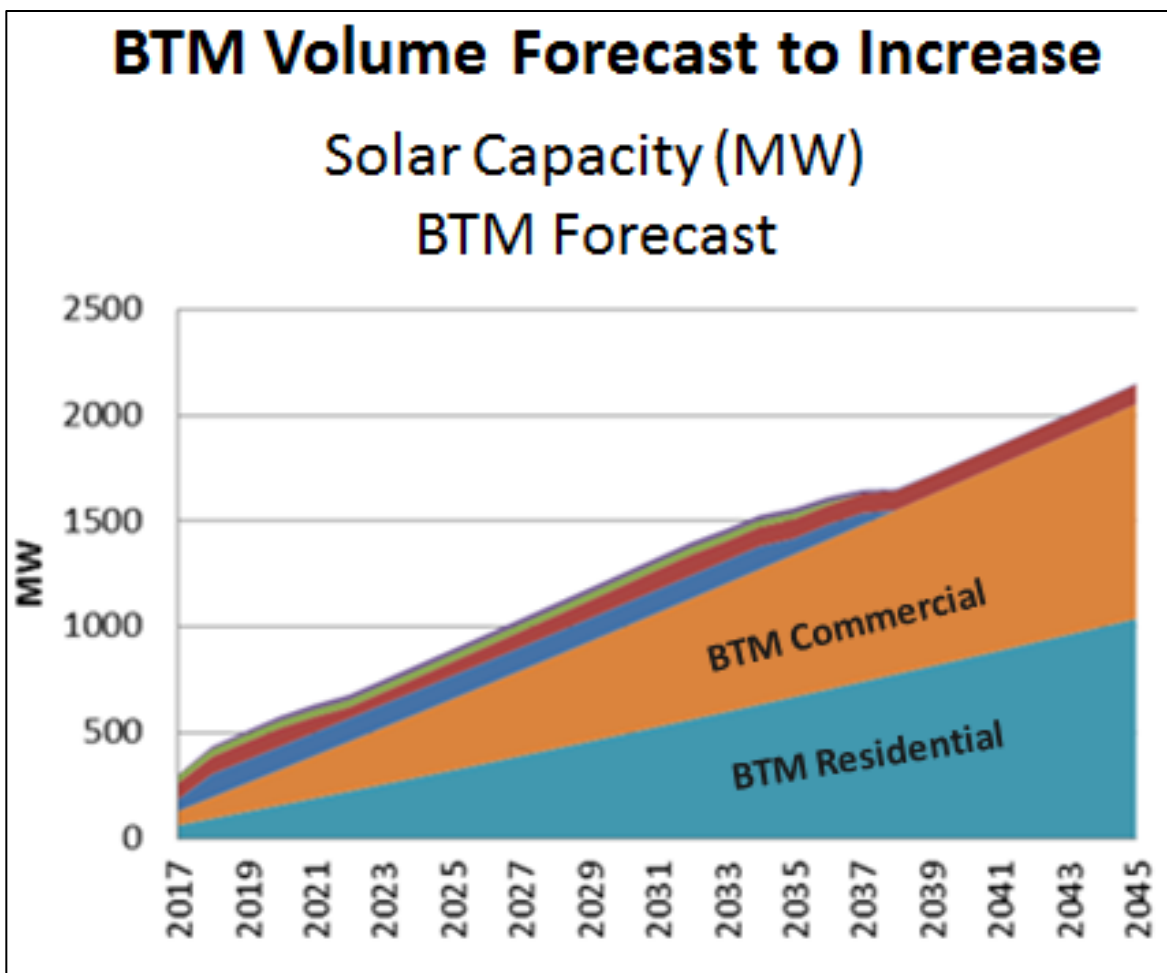


Figure 3. Behind-the-Meter Generation Forecast for the TVA Service Area (2018)

Thus, if left unchecked, the cost-shifting in 2025, from solar technology alone, would be at a rate of approximately \$100 million per year and growing rapidly.

TVA also proposes to lower energy rates for large general service customers. TVA cost of service analysis indicates an excess of the revenues collected from large general service consumers over the costs incurred by TVA to serve these consumers. Benchmarking studies place TVA in the 4th quartile (the bottom 25%) among peers for commercial rates. The marked inequity in large general service rate levels persuaded TVPPA and TVIC to agree with TVA's proposal to lower energy rates for large general service customers.

1.2 Background

1.2.1 TVA's Role in the Power Service Area and Current Relationship to Customers

TVA is a self-financed, wholly-owned corporate agency of the United States. TVA is a public power entity, having no shareholders and receiving no tax dollars. Under the TVA Act of 1933, as amended (the TVA Act), Congress charged TVA with advancing the social and economic welfare of the residents of the Tennessee Valley region. TVA serves a region that consists of parts of seven southeastern states (Figure 1). One of the most important ways that TVA fulfills its congressional mandate is by providing reliable, affordable electric power

to its 154 municipal and cooperative LPCs. These LPCs take delivery of electricity generated and transmitted by TVA and perform the distribution function for their approximately 9.7 million retail consumers of electricity. TVA also sells power to approximately 57 directly served retail customers with large or unusual power requirements.

TVA's wholesale rates for LPCs recover TVA's generation and transmission costs while each LPC's retail rates recover the LPC's wholesale power cost from TVA, plus the LPC's distribution costs.

TVA's success is measured by its effectiveness in meeting the public needs, rather than in creating financial wealth for private shareholders. TVA's ability to serve its customers at competitive wholesale power prices is critical to the success of TVA in accomplishing its mission.

In 2011, TVA changed its pricing structures to send better pricing signals and to more accurately reflect changes in power supply costs over time. The "End-Use Wholesale" rate structure that recovered TVA's fixed and variable costs entirely through variable, volume-based demand and energy charges was replaced with a wholesale demand and energy pricing structure that included seasonal and time-of-use price differentials. For an interim period until October 2012, LPCs were able to choose between the time-of-use demand and energy and the seasonal demand and energy schedules. Since October 2012, most LPCs have been served under a time-of-use demand and energy rate structure. The wholesale demand and energy rates implemented in 2011 restored the price incentive for LPCs to undertake load management activities at the local level. By October 2015, all LPCs were served under the Seasonal Time-of-Use wholesale structure, and TVA approved another rate change to further improve pricing signals. TVA refined the pricing structure of its wholesale electric power rates and programs to encourage cost-saving behavior to help to keep rates as low as feasible. TVA also made changes to better align the power rates for LPCs and directly served customers with their cost of service and to improve the competitiveness of industrial rates. TVA simplified the suite of demand response and other power products offered.

The largest component of an end-use consumer's retail bill is the LPC's cost of delivered wholesale power (what TVA charges the LPC), which is passed through to the consumer. A portion of the consumer's bill recovers the LPC's distribution costs and margin.

1.2.2 TVA Rate Setting Authority, Policies, and Procedures

The TVA Act grants to the TVA Board of Directors responsibility for establishing the rates charged to LPCs and other customers for electric power supplied by TVA, as well as broad regulatory authority over LPC resale rates and conditions of service. TVA has a statutory mandate to regulate LPC retail rates. The TVA Board exercises its rate responsibility within the framework of the TVA Act, specifically the underlying policies and requirements of Sections 10, 11, and 15d of the Act.

Section 10 of the TVA Act authorizes the TVA Board "to include in any contract for the sale of power such terms and conditions, including resale rate schedules, and to provide for such rules and regulations as in its judgment may be necessary or desirable for carrying out the purposes of this Act." Under Section 11 of the TVA Act, power projects are to "be considered primarily as for the benefit of the people" of the region as a whole, "particularly the domestic and rural consumers to whom the power can economically be made available...."

As part of the bond financing amendment to the TVA Act in 1959, Congress directed TVA to

charge rates that produce gross revenues sufficient to provide funds for operation, maintenance, and administration; provide payments to states and counties in lieu of taxes; provide debt service on bonds; provide payments to the United States Treasury for repayment of past government appropriations plus an additional return; provide additional margin for investment in power system assets; and for other purposes connected with TVA's power business having due regard for the primary objectives of the Act, including the objective that power shall be sold at rates as low as are feasible. (TVA Act, Section 15d(f)).

The TVA Board of Directors exercises the responsibility to establish rates, and the LPCs and TVA establish the procedures governing rate adjustments and rate changes. These procedures are set forth in the Schedule of Terms and Conditions of each LPC's wholesale power contract. The section of the wholesale power contract entitled "Adjustment and Change of Wholesale Rate and Resale Rates" provides that the wholesale rate and resale rates in the power contract are subject to adjustment and change from time to time "in order to assure TVA's ability to continue to supply the power requirements of [the LPC] and TVA's other customers on a financially sound basis"

The wholesale power contract further provides that:

"Wholesale power rates and charges shall be sufficient to produce revenue from TVA's wholesale power customers, which, together with revenue from its other power customers, will assure TVA's ability each fiscal year to:

(a) meet the requirements of the TVA Act . . .

and (b) meet all tests and comply with the provisions of TVA's bond resolutions . . . in such a manner as to assure its ability to continue to finance and operate its power program at the lowest feasible cost."

TVA's wholesale rate structure and associated programs must be altered from time to time to better reflect cost to serve and to remain competitive within the market, so as to allow sales of power at the lowest feasible rates. TVA's wholesale power contracts with LPCs provide different processes for making "rate adjustments" and "rate changes."

A "rate change" is the process by which TVA changes the structure of the rates. The current proposal is an example of a rate change. Rate changes are designed to be "revenue neutral" to TVA. Revenue neutral means that the new rates, when applied to the same underlying power usage, are intended to result in the same revenue being collected by TVA under the old rates. Under the wholesale power contracts, either TVA or an LPC may request that the parties meet and endeavor to reach agreement upon changes to the contract's Schedule of Rates and Charges. If the parties cannot reach agreement within 180 days, TVA may provide 30 days' notice prior to implementing rate changes it determines to be necessary. Rate changes can involve changes in cost allocation and rate structure that can raise power bills for some customers and lower them for others, with an overall revenue-neutral impact to TVA.

A "rate adjustment" is the process by which TVA increases or decreases rates to match revenue needs. Rate adjustments tend to have similar impacts across customer classes. Following the rate review procedures set forth in the wholesale power contracts, the TVA Board of Directors can adjust the demand and energy charges in the wholesale and resale rate schedules as necessary to assure adequate revenues to TVA and the LPCs, as required by the TVA Act and the power contracts. A "customer charge" is a fixed monthly fee at the retail level. A "demand charge" is based on the peak amount of electric capacity, expressed in kilowatts (kW), used during a billing cycle. An "energy charge" is based on volumetric electricity consumption over time, expressed in kilowatt-hours (kWh). Typically, residential customers are billed based on a monthly customer charge and an energy charge.

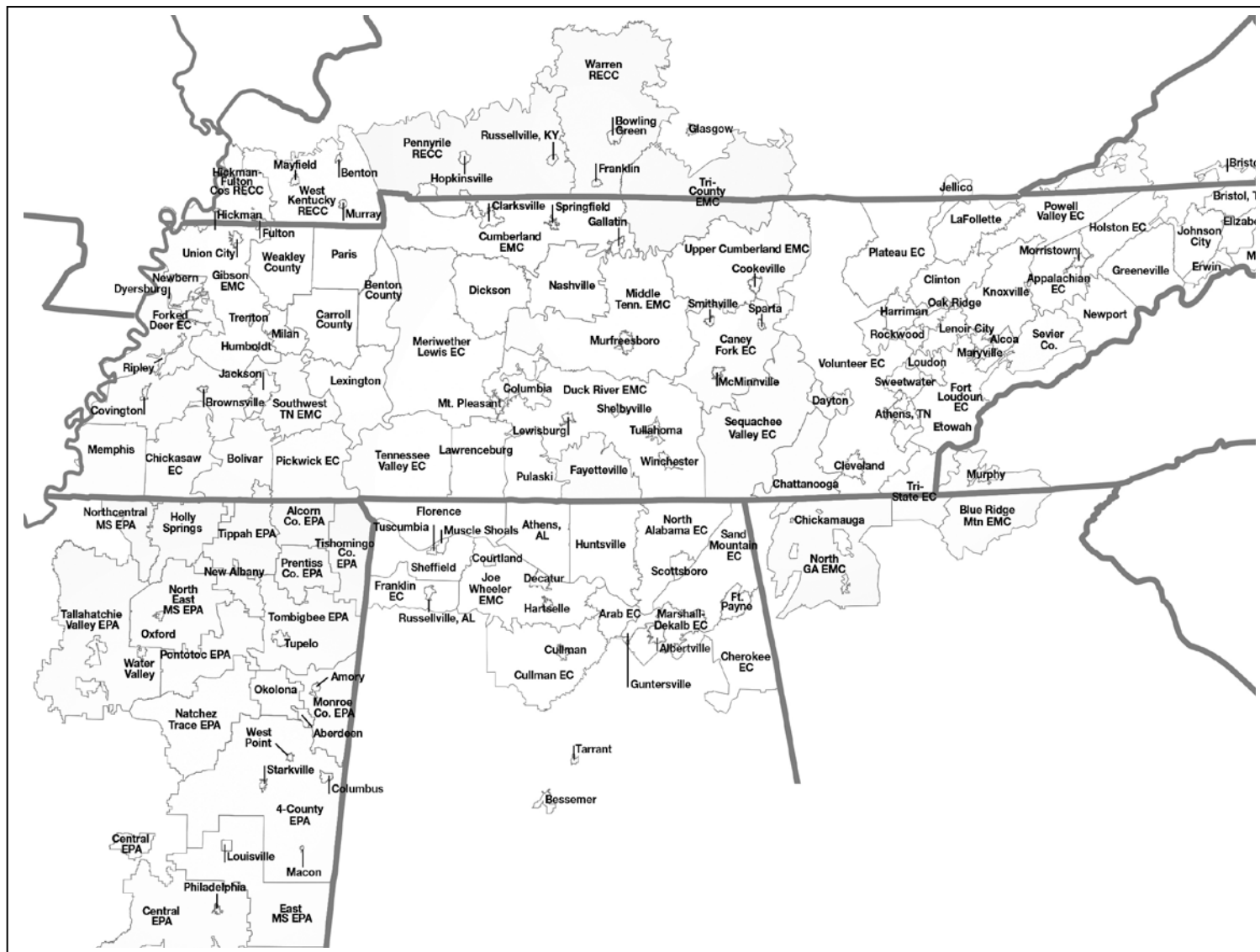


Figure 4. Map of the Seven-State TVA Power Service Area and LPCs

1.3 Other Pertinent Environmental Reviews or Documentation

TVA's 2011 *Environmental Impact Statement (EIS) for TVA's Integrated Resource Plan (IRP*, TVA 2011) identified and selected a long-range strategy to enable TVA to meet the needs of its customers for electricity for the subsequent 20 years. TVA supplemented the 2011 IRP in 2015 with another EIS (*Integrated Resource Plan 2015 Final Supplemental Environmental Impact Statement*, TVA 2015), which describes the TVA power system and the anticipated impacts of its future operation. Relevant information from these EISs is incorporated by reference into this EA.

Other pertinent National Environmental Policy Act (NEPA) documents include:

- *Refining the Wholesale Pricing Structure, Products, Incentives and Adjustments for Providing Electricity to TVA Customers - Final Environmental Assessment* (TVA 2015)
- *Elimination of End-Use Wholesale Rate Structure and Introduction of Time-Of-Use Pricing of Electricity at the Wholesale Level - Final Environmental Assessment* (TVA 2010)
- *Public Utility Regulatory Policies Act (PURPA) Standards - Final Environmental Assessment* (TVA 2007)
- *Modification of Rate Structure for Pricing of Wholesale Electricity to Distributors Within the TVA Power Service Area Final Environmental Assessment* (TVA 2003)
- *Alternative Electric Power Rate Structures Final EIS* (TVA 1980)
- *Policies Relating to Electric Power Rates Final EIS*, Volumes 1 and 2 (TVA 1976)

Each of the above documents addresses aspects of TVA's fundamental rate structure and customer classes and TVA's historical relationship with both the LPCs and the consumers of the Tennessee Valley region. The 1976 and 1980 EISs and the more recent EAs concluded that the timing and magnitude of impacts on the physical environment (including air, water, land, and other primary natural resources) were somewhat speculative, primarily because rate change effects on the physical environment depend on numerous intervening decisions to be made by persons and entities outside TVA's control. Despite these uncertainties, the EISs and the EAs conclude that in all likelihood, any resulting physical environmental impacts would be insignificant.

1.4 Public Involvement

TVA initiated the rate change process by sending letters to all LPCs on August 9, 2017 (see Appendix A). This notification was made in accordance with the rate change provisions of the existing TVA wholesale power contracts. The letter describes the process of meeting with LPCs and endeavoring to reach agreement on all aspects of the rate change proposal. TVA held a series of meetings with LPCs and directly served customers to endeavor to reach agreement on the proposal. These meetings, including presentations, discussions, and listening sessions, aided in the scoping of issues and alternatives considered for this EA, and they provide important stakeholder input to the process.

On March 9, 2018, TVA issued the draft EA for public review and comment. During the comment period, TVA received 1,741 submissions from the public and other stakeholders. Most submissions (1,449) originated from one of four form letters: the Sierra Club submitted a letter cosigned by 725 members; 608 people sent a message originating from the Southern Alliance for Clean Energy; 74 members of the Volunteer Energy Cooperative submitted a form letter; and 42 people voiced opposition in an form letter of unknown origin. One comment submission was received from the State of Tennessee Department of Environment and Conservation, nine from nongovernmental organizations, and the remainder were from private citizens and businesses. Most commenters expressed opposition to the proposal for a variety

of reasons. Many felt that the proposal would result in a financial burden because they believed that their electricity bill would increase. Many expressed concern that the proposal creates a disincentive for consumers to conserve energy or invest in distributed energy resources. Others expressed concern that the proposal disproportionately impacts low-income residents. About 10 submissions included substantive input relating to the impacts and other issues in the EA.

TVA considered these comments when completing the final EA and has responded to substantive comments in Appendix D. As noted in the respective responses, TVA revised the EA as a result of several comments to improve clarity, resolve typographical or grammatical errors, or improve the descriptions or analysis.

Because there are no state or federal permits or licenses required for TVA to undertake this action, TVA has not consulted with other agencies relating to the proposal.

1.5 Necessary Permits or Licenses

There are no federal permits or licenses required for TVA to undertake this action.

CHAPTER 2 - ALTERNATIVES

This section describes the No Action Alternative and four rate change alternatives. This section of the Final EA includes a new alternative (Alternative C1) not included in the draft EA.

In the draft EA, TVA analyzed three rate change alternatives and identified Alternative C as its preferred alternative. Alternative C represented TVA's proposal outlined in its August 2017 letter to LPCs, which would reduce the Standard Service energy rate by 1¢ per kWh (about \$1.2 billion) and establish a grid access charge to recover an equivalent amount of revenue.

In the draft EA, TVA considered two additional alternatives to represent a range of potential rate changes. One of the alternatives (Alternative B) would include grid access charges which amount to less than the proposed \$1.2 billion (0.25¢ per kWh); the other (Alternative D) would include grid access charges which would amount to more than \$1.2 billion in (2.5¢ per kWh).

In the final EA, TVA has added an additional alternative, Alternative C1, to analyze the rate change proposal that TVA staff recommend for adoption by the TVA Board. Under Alternative C1, TVA would reduce the wholesale Standard Service energy rate by 0.5¢ per kWh and introduce a wholesale grid access charge that would recover an equivalent amount of revenue. Alternative C of the draft EA is referred to as Alternative C2 in the final EA.

2.1 Alternative A (The No Action Alternative)

Under the No Action Alternative, TVA would take none of the proposed actions. The currently available wholesale rate schedules would not be changed. A description of TVA's current wholesale and resale rate structure and other relevant matters is provided below.

TVA's wholesale rates have continued to evolve since the transition from End-Use Wholesale to demand and energy rates in 2011. In 2011, TVA moved from an End-Use Wholesale structure to a wholesale demand and energy structure that included seasonal and time-of-use options. TVA also modified the fuel adjustment clause to reflect monthly fuel costs rather than monthly adjustments to a base fuel rate. In 2015, the total fuel cost was further segmented into Standard Service and Non-Standard Service classes, the on-peak energy window was narrowed, and a maximum demand component was introduced. Compared to pre-2011 rate structures, these changes have resulted in better alignment of prices with TVA's costs and provide improved price signals that encourage wise use of electricity, while maintaining low-cost, reliable electricity.

2.1.1 Current Wholesale Rates

The current wholesale rate schedule applicable to LPCs involves two components: the first for Standard Service and the second for Non-Standard Service. The costs to provide power to Standard Service and Non-Standard Service customers are different. Standard Service comprises the majority of LPC service and includes LPC sales to residential customers and small commercial and manufacturing customers. Non-Standard Service includes power delivered to large commercial and manufacturing customers with power demands over 5,000 kW and to fewer than 225 customers with contract demands between 1,000 kW and

5,000 kW that are served by LPCs or directly served by TVA under a time-of-use structure. This LPC-served Non-Standard Service power usage is removed from the LPCs' total demand and energy and billed separately at the Non-Standard Service wholesale rates. This is designed specifically to recover generation and transmission costs to serve these loads.

Wholesale Standard Service

Currently, LPCs are billed under a time-of-use (TOU) rate structure. The TOU structure uses pricing signals to compensate customers for shifting demand for electricity from high cost on-peak periods to lower cost off-peak periods. On-peak periods are from 1:00 pm to 7:00 pm Central Time during summer months as well as April, May, and October and from 4:00 am to 10:00 am Central Time during winter months and November. All hours not defined as on-peak are off-peak. Summer months are June, July, August, and September. Winter months are December, January, February, and March. Transition months are April, May, October, and November. LPCs are billed for on-peak energy, off-peak energy, maximum demand, and on-peak demand.

Wholesale Non-Standard Service

For LPCs that serve large customers under Non-Standard Service rates, the current wholesale rate depends on the rate election of the retail customers. These retail customers previously had the option of either a TOU or a seasonal demand and energy (SDE) structure. The wholesale rate schedule includes corresponding TOU and SDE rates that are billed to the LPC for wholesale charges consistent with the retail structure applied. However, the optional SDE rate structure expired effective September 30, 2017. Since the expiration of the optional SDE option, all wholesale Non-Standard Service has been billed under the existing TOU rates.

General Service Rates for Large Consumers

Cost of service studies for recent years have demonstrated an excess of the revenues collected from large general service consumers over the costs incurred by TVA to serve those consumers (see Appendix C for the most recent Cost of Service study). Benchmarking studies place TVA in the 4th (bottom) quartile for commercial rate competitiveness. The current situation conflicts with two of TVA's objectives in setting rates: that revenue be recovered in proportion to costs by customer class and that rates be competitive. These conflicts would continue under Alternative A.

Total Monthly Fuel Charge

Since October 1, 2006, the Adjustment Addendum to the Schedule of Rates and Charges has included a Fuel Cost Adjustment (FCA) formula to reflect changing fuel and purchased power costs on an ongoing basis. The FCA formula allocates costs between small customers and large customers. Small customers are Standard Service customers as well as all other customers with contract demands less than or equal to 1,000 kW. Large customers are TVA directly served customers with contract demands greater than 1,000 kW and large customers served by LPCs as defined in the wholesale rate schedules. The FCA formula uses a resource cost allocation methodology to allocate total fuel and purchased power costs in proportion to the average hourly load of large customers and small customers, weighted by the incremental hourly dispatch cost of the last 100 MW of TVA resources dispatched in that hour. This approach ensures a fair distribution of costs, which aligns revenue collected with costs to provide electricity by customer class.

2.1.2 Current Resale Rates

Retail Rates

The retail rates for each LPC are based on the wholesale power costs and distribution costs for that LPC. LPCs have the option to develop or adjust their own rates and rate structures, subject to final TVA regulatory approval. This process is known as a Local Rate Action (LRA). During this process, LPCs submit requests to TVA detailing the proposed adjustments and resulting impacts. TVA evaluates the LRA request based on three primary elements: cost basis, gradualism, and nondiscriminatory treatment. If the request is approved, the new rates are contractually agreed upon by TVA and the LPC through a supplement to their wholesale power contract.

Generally, for residential customers and for commercial and industrial customers with contract demands less than 50 kW, the retail rate structure consists of a small monthly customer charge and an energy charge. For commercial and industrial customers with contract demands greater than 50 kW, the rate structure typically consists of a monthly customer charge, an energy charge, and a demand charge. For large commercial and industrial customers with contract demands greater than 5,000 kW, the rate structure consists of a monthly customer charge, an on-peak energy charge, an off-peak energy charge, a peak demand charge, and a maximum demand charge.

Hydro Preference Allocation Rebalancing

Beginning in 1952, the TVA Board has carried out requirements in sections 10 and 11 of the TVA Act by allocating the benefit of the hydroelectric generation to residential consumers. The TVA Board has assigned a value of \$250 million to the hydro generation. TVA allocates the hydro preference by collecting \$250 million annually from all nonresidential consumers and distributing \$250 million annually to LPCs for further distribution to their residential consumers. The \$250 million collected from nonresidential consumers are referred to as hydro debits, the \$250 million distributed to residential consumers are referred to as hydro credits, and the hydro debits and credits are referred to collectively as hydro allocation adjustments. To ensure that the amounts distributed and the amounts collected approximate the \$250 million allocation approved by the TVA Board, the hydro allocation adjustments are subject to yearly computation and adjustment. The amount of hydro preference allocation debits collected from nonresidential consumers for each of the most recent five years has fallen short of the \$250 million level approved by the TVA Board because of a decrease in commercial and industrial sales. The amount of hydro preference allocation credits distributed to residential consumers has been close to the \$250 million level approved by the TVA Board.

2.1.3 Other Matters

Hydro Preference Allocation Charges

The hydro allocation adjustments are designed to distribute the value of the hydro generation benefits to residential consumers and to collect the value of the hydro generation benefits from nonresidential consumers. The hydro allocation adjustment debits and credits are currently embedded in the base rates of the various wholesale and retail rate schedules. LPCs are required to report hydro allocation data to TVA on a monthly schedule.

Hydro Preference Allocation Mechanism

Currently, the LPCs receive a credit each month for each residential customer and for each kWh of residential energy sales. LPCs are charged each month for each kWh of small consumer sales and for each kW of large consumer demand and each kWh of large consumer energy sales. Hydro preference allocation debits for directly served customers are the same as those for like-sized LPC served consumers.

Adjustment Addendum Amounts

The adjustment addenda for TVA wholesale rate schedules and for LPC retail rate schedules contain columns for the environmental adjustment initially approved by the TVA Board in 2003 and in 2013 was extended indefinitely or until consolidated in base rates and for the amounts of all rate adjustments approved after 2014. These amounts are added to the base rates included in the various rate schedules to determine the total applicable rate for billing.

Mid-Month Billing

There are six LPCs for whom invoices are prepared mid-month rather than at month end. TVA would continue to work individually with these LPCs to standardize their billing cycles.

ESS Reporting

The power contract provides for monthly reporting data via the Electricity Sales Statistics (ESS) system.

Outdoor Lighting Rate Schedule

Outdoor lighting retail schedules consist of Parts A and B. Part A is street lighting, traffic signals, and athletic fields. Part B is private area lighting and includes a list of available fixtures which LPCs offer.

Rate Schedule Unification

There are currently three separate rate schedules for large general service customers and three rate schedules for large manufacturing service customers.

2.2 Alternative B (Reducing the Wholesale Standard Service Energy Rate by 0.25¢ per kWh and Adding Corresponding Grid Access Charges)

2.2.1 Wholesale Rates

Wholesale Standard Service

TVA proposes to reduce wholesale Standard Service energy rates and to introduce a wholesale grid access charge that would recover an equivalent amount of revenue. The change would be revenue neutral for TVA and would become effective in October 2018. The proposed wholesale grid access charge would be allocated to each LPC based on the LPC's percentage contribution to the total Standard Service energy usage during a historical baseline period. Under Alternative B, the reduction in energy rates would be 0.25¢ per kWh.

Wholesale Non-Standard Service

TVA proposes to improve fixed cost recovery from consumers with contract demands greater than 5,000 kW served under TOU Service rate schedules by implementing a new rate design. The change would be revenue neutral for TVA and would be implemented in October 2019. TVA is continuing to negotiate with both TVPPA's Rates and Contracts Committee and TVIC to finalize the structures. A number of structures are under consideration, but the bill impacts are generally expected to fall within a range of -2 percent to +5 percent.

General Service Rates for Large Customers

TVA further proposes to decrease wholesale TOU Service energy rates under rate schedules General Service B, C, and D by \$23 million and to increase wholesale Standard Service rates and large manufacturing service rates approximately 0.3 percent to maintain TVA revenue neutrality.

Total Monthly Fuel Charge

TVA proposes to change the wholesale rate schedule fuel cost adjustment resource cost allocation methodology to isolate the cost allocation weighting for large customers served under a manufacturing service rate from large customers served under a general service rate.

2.2.2 Resale RatesRetail Rates

To enable LPCs to continue operating on a financially sound basis after the wholesale rate change, TVA proposes to change resale rates to reflect changes in wholesale power costs and to improve the alignment of retail charges with the new wholesale charges. TVA projects that due to the small changes in energy rates under Alternative B, most LPCs would not change their retail rate structures. However, LPCs would have the option to develop customized rates, subject to the TVA Board-approved process.

Hydro Preference Allocation Rebalancing

TVA proposes to rebalance the hydro allocation credits distributed to residential consumers with the hydro allocation debits collected from nonresidential consumers to reflect the decrease in commercial and industrial sales. The process of rebalancing the credits and debits is not part of the rate change process as set forth in the power contract but is governed by other language in the wholesale and resale rate schedules. The exact amounts of the rebalancing cannot be determined until after June 30, 2018, in accordance with power contract requirements. Based on the imbalance observed in the previous four fiscal years, there is likely to be minimal change to the distribution of credits to residential consumers and a \$30 million to \$40 million increase in the collection of debits from nonresidential consumers, spread evenly among all nonresidential consumers.

2.2.3 Other Matters

TVA proposes the following additional administrative changes to simplify and improve processes:

- a) Moving all hydro allocation adjustments to the appropriate adjustment addendum;
- b) Providing LPCs flexibility in their administration of the hydro allocation credits distributed to residential consumers;
- c) Incorporating the environmental adjustment and other adjustments currently on the adjustment addendum into the base rates;
- d) Negotiating individually with LPCs to phase out mid-month wholesale billing;
- e) Updating the ESS reporting requirements;
- f) Revising Part B of the Outdoor Lighting rate schedule to replace the list of available fixtures with a cost-based formula; and
- g) Consolidating the B, C, and D rate schedules into one manufacturing schedule and one general service schedule, maintaining the current rate structure and separate rates for each class.

2.3 Alternative C1 (Reducing the Wholesale Standard Service Energy Rate by 0.5¢ per kWh and Adding Corresponding Grid Access Charge)

Alternative C1 is similar to Alternative B, except that the reduction in the wholesale Standard Service energy rates that would be implemented would be 0.5¢ per kWh. TVA would introduce a wholesale grid access charge that would recover an equivalent amount of revenue. As with Alternative B, the changes would become effective in October 2018 and all associated decisions described under Alternative B relating to wholesale rates, resale rates,

and other matters would be implemented. TVA would work with individual LPCs to determine their timeframe for implementing revised rates. No changes associated with this rate proposal would take place prior to October 1, 2018, and LPCs would have the option to defer implementation until October 1, 2019.

Alternative C1 is the rate change alternative introduced by TVA in the Final EA after consideration of input from the public, LPCs, and directly served customers. This alternative will be recommended to the TVA Board for approval.

2.3.1 Implementing Guidelines

Although the proposed wholesale changes would be revenue neutral to TVA, they would affect the manner in which wholesale revenue is collected, and each LPC may be impacted differently. To address these varying impacts, TVA has developed and would apply a methodology to allocate each LPC's wholesale grid access charge to each of its retail classes based on each retail class's contribution to the LPC's historic sales.

Under Alternative C1, C2, and D, TVA would design default retail rate structures and rate levels for each LPC (excluding the four LPCs that set their own retail rates) to allocate the proposed wholesale grid access charge to the retail rate classes based on the average contribution of each class to total Standard Service sales for TVA fiscal years 2013 through 2017. Changes may include implementation of a declining block rate structure, introduction of a demand charge where one did not previously exist, an hours-use-of-demand structure, and a demand ratchet on distribution delivery charges. New default rate designs are intended to be revenue neutral.

Rather than implementing the TVA-designed default retail rates, each LPC may elect optional retail rates based on its non-fuel power cost recovery rates adjusted for its individual calculated maximum rate impact. Although the average impact of the proposed wholesale rate change for each LPC is zero, individual LPCs may see an increase in their wholesale bills if their actual Standard Service usage is below their average Standard Service usage. TVA has evaluated wholesale financial impacts of the wholesale rate change for each LPC for TVA fiscal years 2013 through 2017. The maximum annual bill impacts range from 0.04 percent to 0.78 percent.

Under Alternative C1, TVA would apply a series of thresholds to ensure that retail bill impacts associated with the translation of wholesale changes to retail are implemented gradually. Using these thresholds, TVA would limit the amount of revenue recovery allocated to any single retail rate class and the amount of rate increase for any single customer within that retail rate class.

To ensure that retail bill impacts are consistent with the wholesale rate actions, TVA's proposed default retail rates would limit a maximum increase for residential customers to no more than \$2 per customer per month. TVA would use a similar approach with the GSA1 rate class. Default retail rates for Standard Service demand-metered customer classes would be designed such that bill impacts would generally fall within a range of approximately -2 percent to +2 percent.

Retail bill impacts associated with the LPCs who choose the proposed optional retail rates would be consistent with the maximum wholesale bill impact to each individual LPC over the five years which TVA analyzed during fiscal years 2013 through 2017. Non-fuel power cost recovery rates would be adjusted by each LPC's worst case outcome (ranging from 0.04

percent to 0.78 percent); therefore, resulting bill impacts for all customers would be less than each LPC's wholesale bill impact.

In lieu of implementing either the default retail rates or the optional retail rates described above, LPCs would be able to propose their own rate structures and retail rate designs. TVA staff would evaluate each request individually to determine its consistency with the retail rate review process established by the TVA Board in August 2014. LPCs that request customized retail rate designs outside these boundaries must provide a definitive underlying cost basis when the requests are submitted. TVA staff would evaluate requests and determine whether they should be approved, rejected, or sent to the Audit, Risk, and Regulatory Board Committee for further review and evaluation.

TVA is not recommending a retail grid access charge for residential customers. However, if an LPC submits such a request, the request would be evaluated under the retail rate guidelines approved by the TVA Board. In recognition of its novel nature, TVA staff would generally recommend to the Audit, Risk, and Regulatory Committee a maximum retail grid access charge of \$4, a commensurate reduction in energy rates, and that it be applicable to higher use customers. Finally, TVA staff would recommend that this level of retail grid access charge be phased in over multiple years.

Because TVA does not determine whether or how each LPC responds to the proposed rate change or the extent to which Standard Service customers are affected, the potential impacts of Alternative C1 to these customers is difficult to assess precisely. Generally, however, these implementing guidelines would be employed to ensure a gradual transition and to minimize bill impacts. The analysis below assumes that LPCs would adopt the proposed default retail rates, which TVA believes would closely approximate the actual effects.

2.4 Alternative C2 (Reducing the Wholesale Standard Service Energy Rate by 1.0¢ per kWh and Adding Corresponding Grid Access Charge)

Alternative C2 represents the rate change proposal that TVA submitted to LPCs in TVA's August 2017 letter initiating the rate change process. Alternative C2 is similar to Alternatives B, C1, and D, except that the reduction in the wholesale Standard Service energy rates that would be implemented would be 1¢ per kWh. TVA would introduce a wholesale grid access charge that would recover an equivalent amount of revenue. As with Alternatives B, C1, and D, the changes would become effective in October 2018. All associated decisions described under Alternative B relating to wholesale rates, resale rates, and other matters would be implemented under Alternative C2.

2.4.1 Implementing Guidelines

Under Alternative C2, TVA would apply similar implementing guidelines as described under Alternative C1 to minimize the potential impacts of the change. TVA would apply the same methodology described for Alternative C1 to allocate each LPC's wholesale grid access charge to each of its retail classes based on each retail class's contribution to the LPC's historic sales.

Similar to Alternative C1, TVA would design default retail rate structures and rate levels for each LPC (excluding the four LPCs that set their own retail rates) to allocate the proposed wholesale grid access charge to the retail rate classes based on the average contribution of each class to total Standard Service sales for TVA fiscal years 2013 through 2017. Changes may include implementation of a declining block rate structure, introduction of a demand

charge where one did not previously exist, an hours-use-of-demand structure, and a demand ratchet on distribution delivery charges. The proposed default retail rate designs are intended to be revenue neutral at the retail class level.

Rather than implementing the TVA-designed default retail rates, each LPC may elect optional retail rates based on its non-fuel power cost recovery rates adjusted for its individual calculated maximum rate impact. Although the average impact of the proposed wholesale rate change for each LPC is zero, individual LPCs may see an increase in their wholesale bills if their actual Standard Service usage is below their average Standard Service usage. TVA has evaluated wholesale financial impacts of the wholesale rate change for each LPC for TVA fiscal years 2013 through 2017. The maximum annual bill impacts range from 0.08 percent to 1.56 percent.

Under Alternative C2, TVA would apply a series of thresholds to ensure that retail bill impacts associated with the translation of wholesale changes to retail are implemented gradually. Using these thresholds, TVA would limit the amount of revenue recovery allocated to any single retail rate class and the amount of rate increase for any single customer within that retail rate class.

To ensure that retail bill impacts are consistent with the wholesale rate actions, TVA's proposed default retail rates would limit a maximum increase for residential customers to no more than \$2 per customer per month. TVA would use a similar approach with the GSA1 rate class. Default retail rates for Standard Service demand-metered customer classes would be designed such that bill impacts would generally fall within a range of approximately -2 percent to +2 percent.

Retail bill impacts associated with the LPCs who chose the optional retail rates would be consistent with the maximum wholesale bill impact to each individual LPC over the five years which TVA analyzed during fiscal years 2013 through 2017. Non-fuel power cost recovery rates would be adjusted by each LPC's worst case outcome (ranging from 0.08 percent to 1.56 percent); therefore, resulting bill impacts for all customers would be less than each LPC's wholesale bill impact.

In lieu of implementing either the default retail rates or the optional retail rates described above, LPCs would be able to propose their own rate structures and retail rate designs. TVA staff would evaluate each request individually to determine its consistency with the retail rate review process established by the TVA Board in August 2014. LPCs that request customized retail rate designs that go outside these threshold boundaries, must provide a definitive underlying cost basis when the requests are submitted. TVA staff would evaluate the requests and determine whether they should be approved, rejected, or sent to the Audit, Risk, and Regulatory Board Committee for further review and evaluation.

TVA is not recommending a retail grid access charge for residential customers. However, if an LPC submits such a request, the request would be evaluated under the retail rate guidelines approved by the TVA Board. In recognition of its novel nature, TVA staff would generally recommend to the Audit, Risk, and Regulatory Committee a maximum retail grid access charge of \$6, a commensurate reduction in energy rates, and that it be applicable to higher use customers. Finally, TVA staff would recommend that this level of retail grid access charge be phased in over multiple years.

Because TVA does not determine whether or how each LPC responds to the proposed rate

change or the extent to which Standard Service customers are affected, the potential impacts of Alternative C2 to these customers is difficult to assess precisely. Generally, however, these implementing guidelines would be employed to ensure a gradual transition and to minimize bill impacts. The analysis below assumes that LPCs would adopt the proposed default retail rates, which TVA believes would closely approximate the actual effects.

2.5 Alternative D (Reducing the Wholesale Standard Service Energy Rate by 2.5¢ per kWh and Adding Corresponding Grid Access Charges)

Under Alternative D, the reduction in wholesale Standard Service energy rates would be 2.5¢ per kWh. As with Alternatives B, C1, and C2, TVA would introduce a wholesale grid access charge that would recover an equivalent amount of revenue. The changes would be implemented in October 2018; the decisions described under Alternative C1 and C2 relating to wholesale rates, resale rates, and other matters would be implemented.

2.5.1 Implementing Guidelines

Under Alternative D, TVA would apply similar implementing guidelines as described under Alternative C1 and C2 to minimize the potential impacts of the change. TVA would apply the same methodology described for Alternative C1 and C2 to allocate each LPC's wholesale grid access charge to each of its retail classes based on each retail class's contribution to the LPC's historic sales.

Under Alternative D, TVA would design default retail rate structures and rate levels for each LPC (excluding the four LPCs that set their own retail rates) to allocate the proposed wholesale grid access charge to the retail rate classes based on the average contribution of each class to total Standard Service sales for TVA fiscal years 2013 through 2017. Changes may include implementation of a declining block rate structure, introduction of a demand charge where one did not previously exist, an hours-use-of-demand structure, and a demand ratchet on distribution delivery charges. The proposed default retail rate designs are intended to be revenue neutral at the retail class level.

Rather than implementing the TVA-designed default retail rates, each LPC may elect optional retail rates based on its non-fuel power cost recovery rates adjusted for its individual calculated maximum rate impact. Although the average impact of the proposed wholesale rate change for each LPC is zero, individual LPCs may see an increase in their wholesale bills if their actual Standard Service usage is below their average Standard Service usage. TVA has evaluated wholesale financial impacts of the wholesale rate change for each LPC for TVA fiscal years 2013 through 2017. The maximum annual bill impacts range from 0.2 percent to 3.9 percent.

Under Alternative D, TVA would apply a series of thresholds to ensure that retail bill impacts associated with the translation of wholesale changes to retail are implemented gradually. Using these thresholds, TVA would limit the amount of revenue recovery allocated to any single retail rate class and the amount of rate increase for any single customer within that retail rate class.

To ensure that retail bill impacts are consistent with the wholesale rate actions, TVA's proposed default retail rates would limit a maximum increase for residential customers to no more than \$2 per customer per month. TVA would use a similar approach with the GSA1 rate class. Default retail rates for Standard Service demand-metered customer classes would be

designed such that bill impacts would generally fall within a range of approximately -2 percent to +2 percent.

Similar to Alternatives C1 and C2, each LPC may elect optional retail rates. Retail bill impacts associated with the LPCs who chose the optional retail rates would be consistent with the maximum wholesale bill impact to each individual LPC over the five years which TVA analyzed during fiscal years 2013 through 2017. Non-fuel power cost recovery rates would be adjusted by each LPC's worst case outcome (ranging from 0.2 percent to 3.9 percent); therefore, resulting bill impacts for all customers would be less than each LPC's wholesale bill impact.

In lieu of implementing either the default retail rates or the optional retail rates described above, LPCs would be able to propose their own rate structures and retail rate designs. TVA staff would evaluate each request individually to determine its consistency with the retail rate review process established by the TVA Board in August 2014. LPCs that request customized retail rate designs that go outside these threshold boundaries must provide a definitive underlying cost basis when the requests are submitted. TVA staff would evaluate the request and determine whether they should be approved, rejected, or sent to the Audit, Risk, and Regulatory Board Committee for further review and evaluation.

TVA is not recommending a retail grid access charge for residential customers. However, if an LPC submits such a request, the request would be evaluated under the retail rate guidelines approved by the TVA Board. In recognition of its novel nature, TVA staff would generally recommend to the Audit, Risk, and Regulatory Committee a maximum retail grid access charge of \$20, a commensurate reduction in energy rates, and that it be applicable to higher use customers. Finally, TVA staff would recommend that this level of retail grid access charge be phased in over multiple years.

Because TVA does not determine whether or how each LPC responds to the proposed rate change or the extent to which Standard Service customers are affected, the potential impacts of Alternative D to these customers is difficult to assess precisely. Generally, however, the implementing guidelines proposed under Alternatives C1, C2, and D would be employed to ensure a gradual transition and to minimize bill impacts. The analysis below assumes that LPCs would adopt the proposed default retail rates, which TVA believes would closely approximate the actual effects.

2.6 Relevant Environmental Issues to be Addressed

Consistent with past environmental reviews conducted by TVA on rate changes, TVA has initially identified the following resources and issues as potentially affected by the proposal:

- Socioeconomics,
- Energy production and use,
- Air resources,
- Water resources,
- Land use, and
- Production of solid and hazardous waste.

As noted, the assessment of potential impacts on the physical environment is speculative because the effects of the rate change on the physical environment depend on decisions made by entities and consumers outside TVA's direct control.

2.7 Comparison of Alternatives

Because of the limited magnitude of the direct and cumulative effect of the four alternative rate structures under consideration, TVA expects that any induced environmental impacts would be indirect, limited, and essentially indiscernible. See Table 2 below.

TVA expects some minor socioeconomics impacts to result from all alternatives. Under Alternative A, cost shifting from DER participants to nonparticipants would continue and likely worsen over time. Higher retail energy rates would likely stimulate minor additional investment in DER compared to the current conditions, if all else is equal. However, this would increase the amount of cost shifting to nonparticipant consumers compared to current conditions. In contrast, Alternatives B, C1, C2, and D would avoid or lessen potential cost shifting while maintaining revenue neutrality. Under Alternative B, no change in the trend of DER adoption is expected, while under Alternatives C1, C2 and D, it is expected that the penetration of DER may be slowed marginally. For existing DER investments where rates are specified by contract, the time for those investments to break even would not be affected.

TVA expects that under Alternative B (reduction in Standard Service energy rate by 0.25¢ per kWh and adding a corresponding grid access charge), most LPCs would not change retail Standard Service rates. Therefore, there would be no to very limited effects on energy use or monthly bills at the retail level for Standard Service customers. Alternatives C1, C2, and D would have minor effects on energy use and monthly bills to Standard Service customers, with negative effects to some customers and positive effects to some customers. The proposed implementing guidelines established by TVA for the proposed rate change for retail customers under Alternatives C1, C2, and D would ensure a gradual transition and minimize bill impacts.

Across the alternatives, there would be a mix of minor negative and minor positive economic effects on households for all alternatives. Each alternative, including the no action alternative (Alternative A), has the potential to slightly increase the monthly bill for a majority of residential customers. Under Alternatives C1, C2, and D, for instance, high-usage households would likely see a decrease of more than 1.5 percent in their average monthly bills while low-usage households would likely see a small increase in their average monthly bills. Low-usage households' monthly bills would increase by a lower amount than moderate-use households. Impacts to low-income households, which likely span a variety of usage levels, would be more than other households as a proportion of household income.

Under Alternatives C1, C2, and D, the average consumer (who uses about 1,250kWh monthly) would experience a \$1 increase to their monthly electricity bill; the maximum increase in a consumer's monthly bill would be small, generally no more than \$2. Alternatives C1, C2, and D would likely have the beneficial effect of lowering households' bills in months of high usage (i.e., summer and winter), therefore helping to stabilize bills from fluctuations due to seasonal variation in weather. More stability is a benefit compared to less stability, all else equal. The greater stability of bills would be more beneficial for low-income households than other households, because higher peak bills due to season or weather are more likely to cause a problem in low-income households than for others.

While the exact changes in Standard Service customers' monthly bills would vary by LPC, TVA projects that the changes would likely be similar across the entire TVA service area.

Therefore, no particular minority or other socioeconomic group would bear a disproportionate share of negative effects. None of the alternatives would create environmental justice issues requiring mitigation, as no meaningful environmental or health effects would occur.

TVA expects minor positive effects to large commercial customers and minor negative effects to Standard Service and large manufacturing customers under Alternatives B, C1, C2, and D. These four alternatives would lower rates for large commercial customers and make the rates more competitive. Rates for Standard Service and large manufacturing customers would increase, however, but still remain competitive (see Appendix B for recent state, regional and national rate comparisons). Combined, these changes are expected to have negligible to minor economic effects on the TVA service area, including negligible changes in revenue and employment for existing firms.

Environmental Impacts	Alternative				
	A	B	C1	C2	D
Socio-Economics	No change; potential effect to TVA and LPCs	Minor bill impacts, although less likely than under Alternatives C and D	Minor bill impacts = typical consumer would experience \$1/month bill increase; stabilization of seasonal bill variation	Minor bill impacts = typical consumer would experience \$1/month bill increase; stabilization of seasonal bill variation	Minor bill impacts = typical consumer would experience \$1/month bill increase; stabilization of seasonal bill variation
Energy Production and Use	No change	No impacts on rates or customer behavior expected; thus, no need for changes in generation or operations	Negligible; price elasticity analysis shows potential decrease of energy sales (kWh) of 0.01%, which would not change TVA generation or operations	Negligible; price elasticity analysis shows potential decrease of energy sales (kWh) of 0.01%, which would not change TVA generation or operations	Negligible; price elasticity analysis shows potential decrease of energy sales (kWh) of 0.01%, which would not change TVA generation or operations
Air Resources	No change	No effects; current conditions continue	Negligible change in energy sales, not substantial enough to result in any identifiable impacts to air resources or GHG releases	Negligible change in energy sales, not substantial enough to result in any identifiable impacts to air resources or GHG releases	Negligible change in energy sales, not substantial enough to result in any identifiable impacts to air resources or GHG releases
Water Resources	No change	No effects; current conditions continue	Negligible change in energy sales, not substantial enough to discern impacts to water resources	Negligible change in energy sales, not substantial enough to discern impacts to water resources	Negligible change in energy sales, not substantial enough to discern impacts to water resources
Land Use	No change	No effects; current conditions continue	Negligible change in energy sales, not substantial enough to discern impacts to land use	Negligible change in energy sales, not substantial enough to discern impacts to land use	Negligible change in energy sales, not substantial enough to discern impacts to land use
Waste	No change	No effects; current conditions continue	Negligible change in energy sales, not substantial enough to discern impacts to waste generation	Negligible change in energy sales, not substantial enough to discern impacts to waste generation	Negligible change in energy sales, not substantial enough to discern impacts to waste generation

Table 2. Comparison of Potential Environmental Impacts

Although economic impacts may vary slightly among the alternatives, there would generally be no variation in impacts to the environment among the alternatives. TVA found that none of the alternative rate changes is substantive enough to result in market responses and customer behavior changes that would require TVA to modify its power generation operations or to alter its power generation and transmission systems. Thus, there would be no discernible impacts to air resources, water resources, land use, or waste production resulting from implementing the alternative rate changes. Because of the absence or limited magnitude of the direct and cumulative effects of the alternative rate structures, TVA expects that any induced environmental impacts would be indirect and essentially indiscernible for any of the alternatives. The comprehensive environmental regulatory programs that exist throughout all of the Valley states would further ensure that any resulting environmental impacts are minor. The potential for derivative secondary impacts to resources such as cultural resources, floodplains, biological resources, endangered species, or wetlands would accordingly be highly unlikely.

Other than implementing guidelines that would be applied under Alternatives C1, C2 and D, TVA has not identified any additional mitigation measures necessary to offset or reduce the level of impacts of the alternatives.

2.8 TVA's Preferred Alternative

TVA's preferred alternative is Alternative C1. This alternative represents the grid access charge and reduction in standard energy rate that TVA and LPCs have agreed to recommend to the TVA Board. TVA notes that Alternative C1 is a rate structure that falls within the range of the 0.25 to 2.5 cents per kWh reduction in the Standard Service energy rate alternatives that were considered in the Draft EA.

CHAPTER 3 - AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section includes the analysis of the potential effects of the rate change alternatives. An analysis of taking no action (Alternative A) is also provided to establish a baseline for comparison among alternatives. This section has been updated to include consideration of a new alternative (Alternative C1) not included in the draft EA.

3.1 Framework for Environmental Impact Analyses - The Electric Power Industry, Need and Supply, and Sources of Impacts

This section describes how TVA acts in the energy market, potential environmental impacts that could be associated with the proposed actions, and the relative level of predicted effects. The area served by TVA will continue to need electricity, and TVA expects that it will continue to provide that energy in the future. As evaluated and discussed in TVA's 2015 IRP Supplemental EIS, TVA expects to provide this energy by generating it from its own facilities or by buying it from specific energy generators or from the general power market.

The potential for environmental impacts to air quality, water quality, waste, or land use depends upon: (1) how and when the wholesale rates set by TVA are reflected in the retail rates established by LPCs; (2) the related decisions made by consumers of electricity in the region in response to rate structure revisions, and (3) how TVA provides energy and meets demand in response to the decisions made by LPCs and the retail consumers.

As shown in Figure 2, the primary source of potential impacts results from the responses of retail consumers of electricity. Different pricing structures for electricity may encourage behavior that leads to the creation, maintenance, or elimination of jobs as consumers make decisions to construct, expand, contract, or close plants and businesses or to increase, maintain, or decrease residential electricity usage by choices of housing, transportation, or consumer goods. Because TVA supplies wholesale power to LPCs who in turn supply retail power to end-use consumers, there is an additional layer of intervening decision-making beyond TVA's control that adds complexity to the analysis of potential impacts. Consequently, assessing environmental impacts based on predicting behavioral changes involves some degree of speculation.

The proposed actions focus on the pricing structures and rates. If approved, the actions would impact two broad groups of consumers: Standard Service customers and large customers. Standard Service customers include residential consumers, small commercial consumers, and small manufacturing consumers. Large customers are commercial or manufacturing consumers with contract demands greater than 5,000 kW.

It is difficult for TVA to predict how each LPC would respond to the proposed wholesale rate change and, consequently, the extent to which Standard Service customers would be affected. LPCs may implement a rate change in a variety of ways. The varying responses by LPCs further complicate assessing potential behavioral changes and estimating potential environmental impacts.

TVA must consider the degree to which consumers at the retail level would likely be affected under each of the three action alternatives. TVA anticipates the following potential responses

by LPCs to the wholesale rate change under consideration: (1) LPCs would make no changes to their retail rate structures and minimal changes to their rate levels; (2) LPCs would make changes to their retail rate structures and minimal changes to their rate levels; or (3) LPCs would make changes both to their retail rate structures and to their rate levels.

The potential environmental impacts of the proposed action (see Figure 2) would depend on (1) whether LPCs decide to revise their retail rates in line with the wholesale rates, (2) the extent to which directly served customers and LPC-served customers increase or decrease their energy use in response to TVA's proposal, and (3) the extent to which new generation facilities must be constructed, existing facilities must be operated or shut down, and the mix of energy resources is modified. With increases or decreases in usage or demand, transmission capabilities may also need to be modified. This attenuation in the chain of causation makes it difficult to predict environmental impacts with precision.

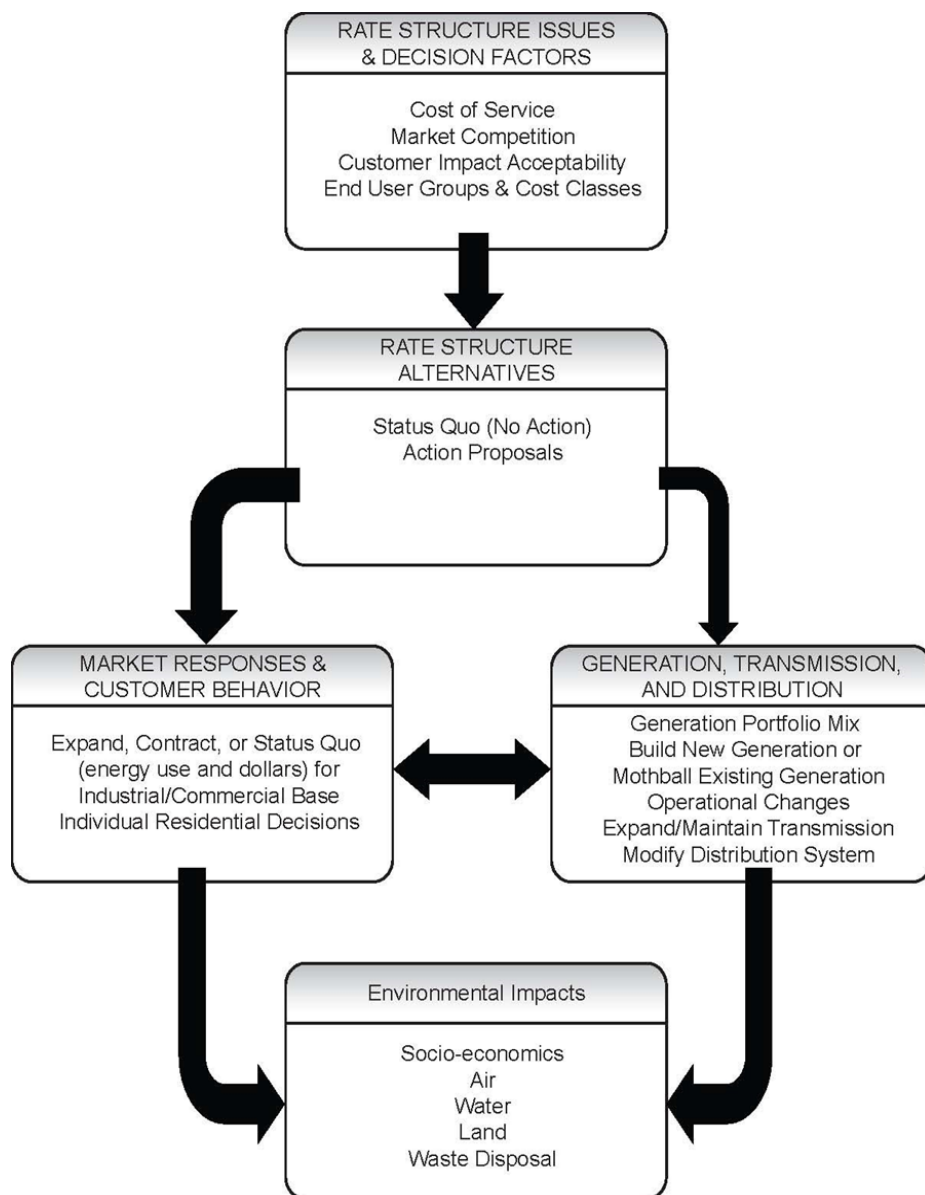


Figure 5. General Framework for Consideration of Issues and Environmental Impact Analyses of Effects from Rate Changes

Consistent with past environmental reviews conducted by TVA on rate changes, TVA has identified the following resources and issues as potentially affected by the proposal: socioeconomics, air quality, water quality, land use, production of solid and hazardous waste, and energy production and use.

As noted, the assessment of potential indirect impacts on the physical environment involves some degree of speculation because the effects of the rate change on the physical environment depend on decisions made by intervening consumers and entities outside TVA's direct control.

3.2 Components Not Affecting the Evaluation of Environmental Effects

Several components of the proposed rate change are administrative in nature. The proposed administrative components would result in no changes to rates and have no potential to impact the environment. The administrative items include:

- all items relating to moving the components of hydro preference allocation debits or credits from base rates to the appropriate adjustment addenda;
- providing flexibility to the LPCs in administering hydro allocation credits;
- consolidating environmental adjustment amounts and rate adjustment amounts from the adjustment addenda into base rates;
- eliminating mid-month billing arrangements with LPCs;
- modifications to ESS reporting requirements;
- revision of the outdoor lighting schedule; and
- unification of the large customer rate schedules.

Altering where the hydro preference allocation debits and credits, the environmental adjustment amounts, and the amounts of previous rate adjustments are presented within the various rate schedules would not change the currently effective rates nor the calculation of subsequent rate adjustments. Likewise, the elimination or continuation of mid-month billing for the six LPCs currently not billed on a calendar-month billing cycle would not affect TVA's electric rates.

Providing optional flexibility to the LPCs in administering the distribution of hydro allocation credits to residential customers would not result in a change in the total hydro allocation credits distributed by TVA, nor in the total hydro allocation credits received by any LPC, nor in the total hydro allocation credits distributed to the residential class customers of any LPC.

Modifying the contractually required ESS reporting would facilitate rate and cost analysis but would not affect rates. The proposed revisions to the outdoor lighting rate schedule would enable LPCs to add lighting fixtures to their rate schedules more easily and more quickly but would not result in changes to the rates for outdoor lighting or the utilization of outdoor lighting. Similarly, the consolidation of the rate schedules for large consumers from six schedules to two schedules would not affect the rates applicable to large consumers. The three rate schedules currently applicable to large general service customers would be consolidated into a single rate schedule, as would the three rate schedules currently applicable to large manufacturing customers.

Because these administrative items would not affect rates and do not have potential to affect the environment, they will not be analyzed further in the EA.

3.3 Socioeconomics

TVA balances the need to meet multiple social and economic goals in the design of its rate structure and rate setting. These goals, described in TVA's Service Commitment, are categorized as the three "E"s:

- Energy: generate safe, clean, reliable and affordable power.
- Economic Development: provide for the industrial development of the Valley by providing low-cost, safe, clean, reliable and affordable electricity to help bring and maintain new investments and good jobs to the region.
- Environment: serve as stewards of the region's natural resources and manage the waterways and surrounding lands to provide multiple benefits to the people in the Valley into the future. (TVA 2018a)

Assuring that power is reliable requires TVA to build or purchase capacity to meet peak demands. Therefore, the fixed costs associated with building to meet peak demand comprise a large portion of TVA's total costs. Simultaneously, TVA is tasked with setting rates that are as low as are feasible. As described in the TVA Act, TVA shall (TVA Act, Section 15d(f)):

*"...charge rates for power which will produce gross revenues sufficient to provide funds for operation, maintenance, and administration of its power system; payments to States and counties in lieu of taxes; debt service on outstanding bonds, including provision and maintenance of reserve funds and other funds established in connection therewith; payments to the Treasury . . . having due regard for the primary objectives of the Act, including the objective that power shall be sold at rates as low as are feasible."*²

It is widely understood that electric utilities are facing challenges meeting their fixed costs. Several studies suggest that utilities, facing changes in both energy use and methods of energy generation, must consider changing rate structures. A recent article published in the Electricity Journal states:

In recent years the fixed cost recovery problem has grown as more costs have been added to utility operations that are not directly tied to providing an incremental kWh of electricity. For instance, energy efficiency programs, discounts to low-income customers, and subsidies for installing distributed generation are now costs that the utility must recover, but are not part of the marginal cost of providing a kWh to a specific customer. In addition, energy efficiency programs and distributed generation have reduced demand and thus required that the revenue shortfall from marginal-cost pricing be made up over a smaller number of kWh. (Borenstein, 2016)

Most electric utilities throughout the United States charge a fixed charge each month that is independent of the quantity of electricity consumed. These fixed charges can be useful because they can reduce the amount of fixed costs collected through volumetric charges and thus minimize the risk that revenue will not cover fixed costs, and allow the utility to invest in sufficient capacity to assure a reliable power supply. However the perceived downside of a fixed charge is that there is no price-incentive for the consumer to change their consumption

² The TVA Act of 1933 is available at:
https://www.tva.gov/file_source/TVA/Site%20Content/About%20TVA/TVA_Act.pdf

patterns as power costs increase or simply to increase energy efficiency. TVA is proposing a revised rate structure that balances the fiscally responsible fixed charge with maintaining a volumetric price that does not discourage energy efficiency or investment in DER. The potential impacts of that proposed change in rate structure and levels are discussed below.

3.3.1 Affected Environment

This EA incorporates by reference the socioeconomic conditions and trends of the TVA region that are discussed in detail in the 2015 IRP Supplemental EIS. In this EA, TVA includes minor updates to characteristics based on more recent data (Table 3). TVA supplies electricity across 178 counties in portions of 7 states. These counties have a population of more than 9 million. Between 2000 and 2016 the region experienced a 14.7 percent growth in population, a rate marginally higher than the 14.5 percent growth experienced across the United States as a whole. In 2016 the TVA region had an economy of \$448 billion in gross product and total personal income of about \$397 billion, about 2.5 percent of the national total (Bureau of Economic Analysis 2016, in current dollars). Income levels in the region have continued to increase relative to the nation in recent years, with median household income of approximately \$47,000, 81 percent of the national average (Table 3). The economy of the TVA region depends more on manufacturing than does the nation as a whole. Manufacturing employment accounts for about 14 percent of regional employment and about 9 percent of regional personal income.

The minority population of the region is estimated to be 26.3 percent of the region's total population. This is well below the national minority population share of 38.7 percent. Minority populations are most concentrated in metropolitan areas of the western half of the region and in rural counties of Mississippi and western Tennessee. The estimated poverty level for counties in the TVA region is 16.6 percent, higher than the national poverty level of 14 percent. Counties with the higher poverty levels are generally outside the metropolitan areas and most concentrated in Mississippi.

Table 3: Summary of Socioeconomic Characteristics

Geographic Region	Population (millions) ^c	Proportion Minority ^c	Median Household Income (\$) ^c	Proportion below Poverty Level ^d	Unemployment Rate ^c	Average Monthly Electricity Use (kWh) ^e	Average Monthly Electricity Bill (\$) ^{e, f}
TVA Service Area ^a	11.5	26.3%	47,347	16.6%	5.1%	1,150	121.34
Southeastern United States ^b	79.9	37.7%	51,355	15.7%	5.1%	1,160	128.07
United States	326.5	38.7%	58,161	14%	5%	897	112.59

^a The TVA service area includes portions of seven states: Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee, and Virginia. This row includes information from any counties that are fully or partially served by TVA power, either directly or through LPCs.

^b Includes all states in the TVA service area plus Florida, Louisiana, South Carolina, and West Virginia.

^c Economic Research Service, Department of Agriculture (2016)

^d Bureau of Census (2016)

^e EIA (2017)

^f For TVA service area, \$18.41 customer charge and \$0.0895/kWh is assumed.

Figure 6 below shows the distribution of monthly residential bills in the TVA service area by kWh consumed. Approximately 50 percent of monthly bills do not exceed 1,000 kWh and only 15 percent exceed 2,000 kWh.

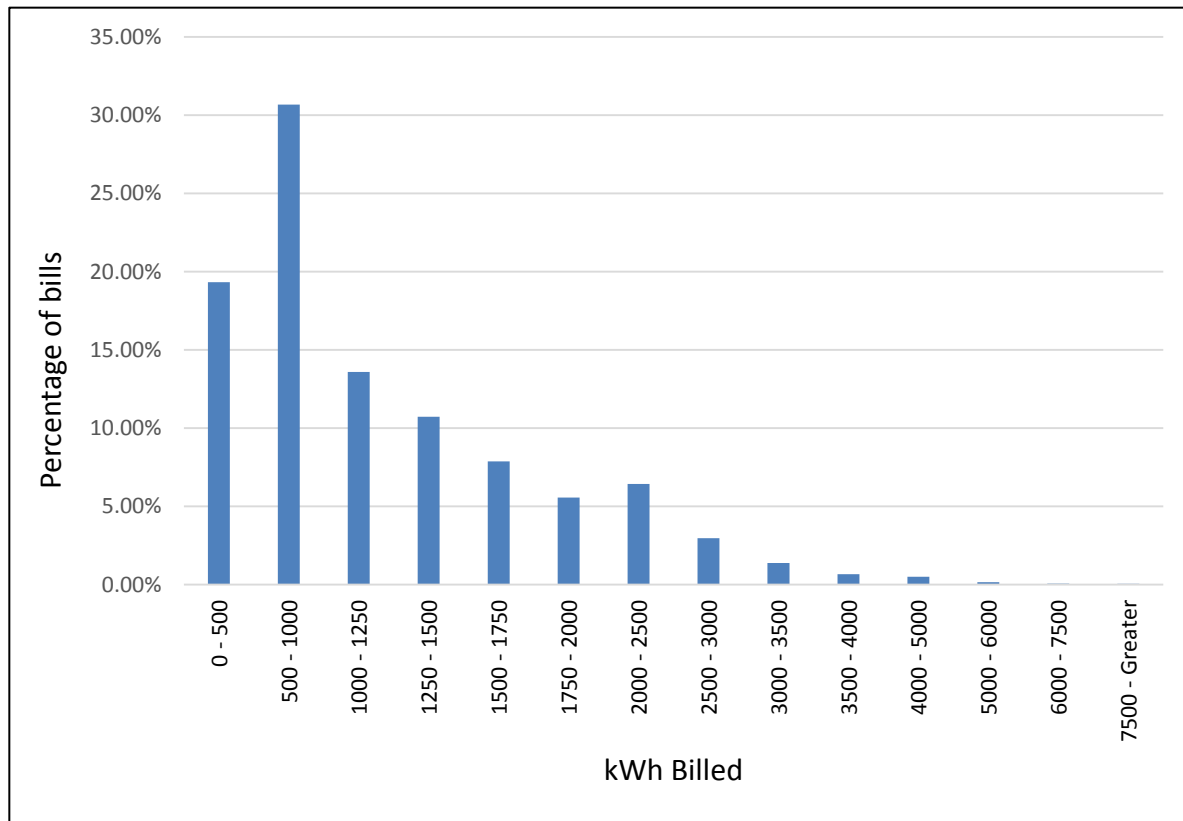


Figure 6: Distribution of monthly residential bills in the TVA service area in Fiscal Year 2017

Expenditures on electricity in the TVA service area are fairly similar across income levels (Figure 7 below). The highest electricity expenditures are paid by the highest income group, whose expenditures are approximately 30 percent higher than the lowest expenditure group. Renters tend to pay less on electricity than housing owners for all income groups.

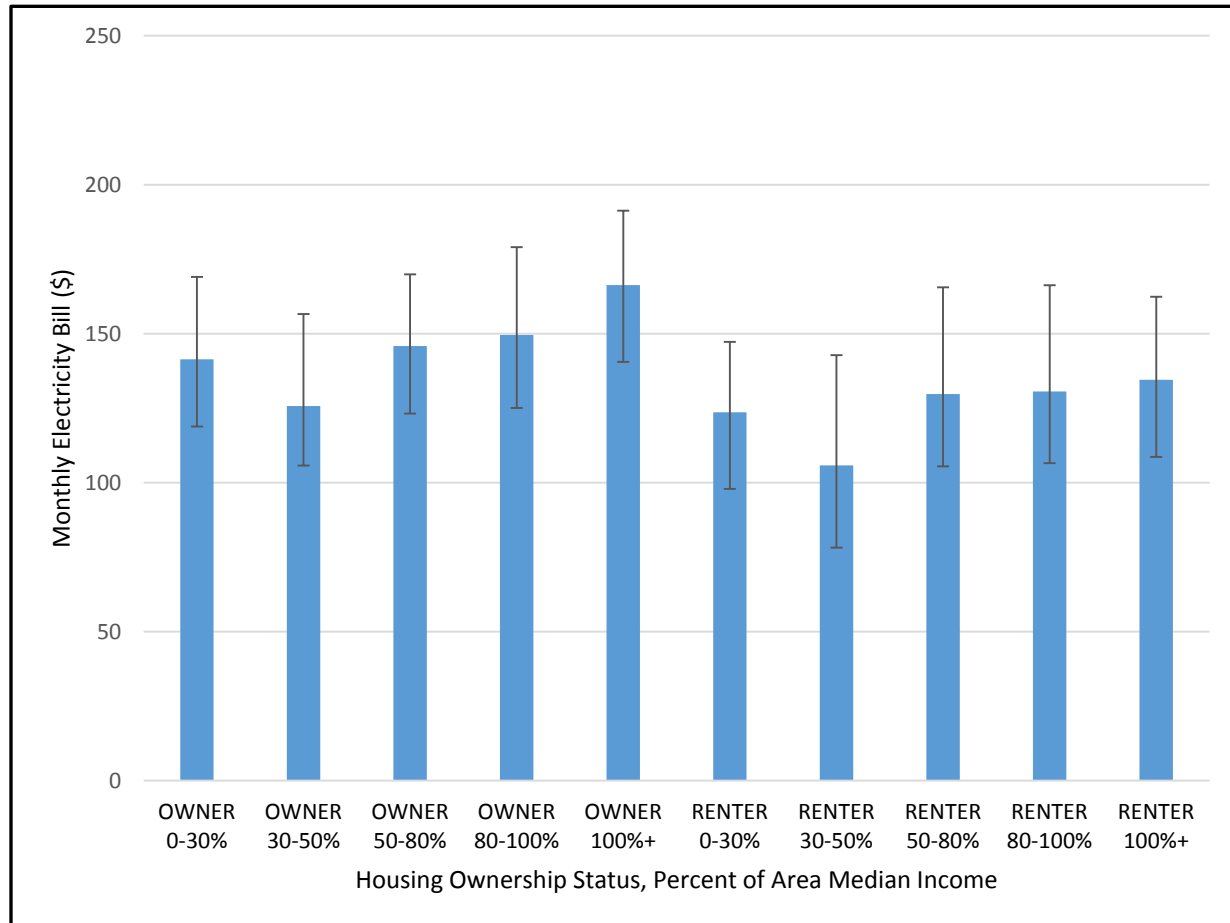


Figure 7: Monthly Electricity Expenditures across Counties served by TVA. Blue bars are the median. Black bars are the range between 5th and 95th percentiles. (Data from DOE 2018).

The energy burden on low-income households throughout the TVA service area is relatively high (Figure 8). The proportion of annual income spent on electricity decreases as income increases across both owner-occupied and renter-occupied housing units. Renter-occupied households tend to spend slightly lower proportions of their annual incomes on energy.

On average, households in the lowest income group are paying more than 15 percent of their annual income on electricity, and in some counties pay over 20 percent for owner-occupied housing units. The next lowest income group pays nearly 10 percent on average. These groups are the most vulnerable to increases in electricity prices.

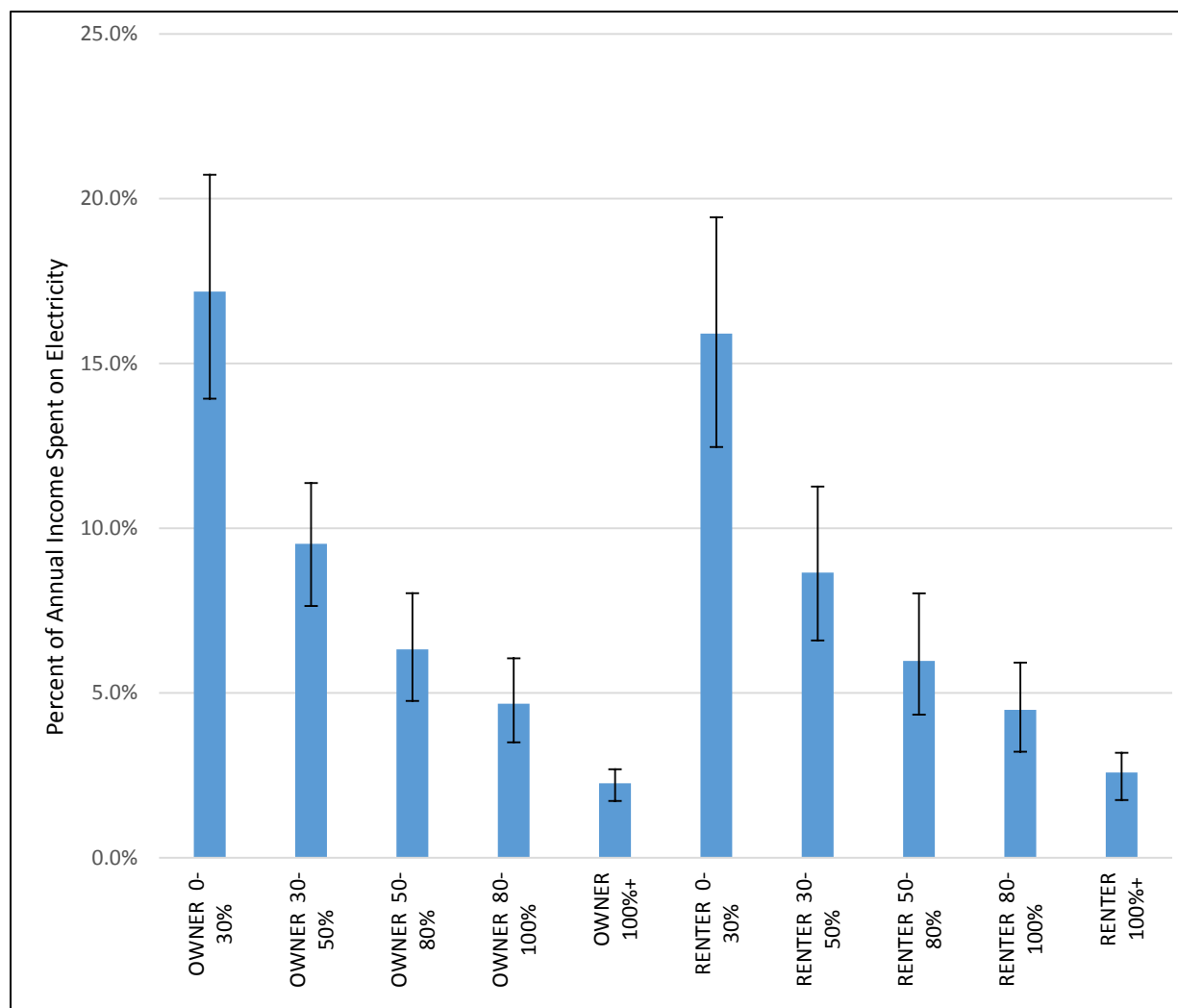


Figure 8: Percent of Annual Income spent on Electricity in Counties served by TVA.

Blue bars are the means across counties. Black bars show the range between the 5th and 95th percentiles. (Data from DOE 2018)

Low-income households in the TVA service area are more likely to be minorities (Figure 9 below). More than 25 percent of each minority group, except Asians, are below the poverty level.

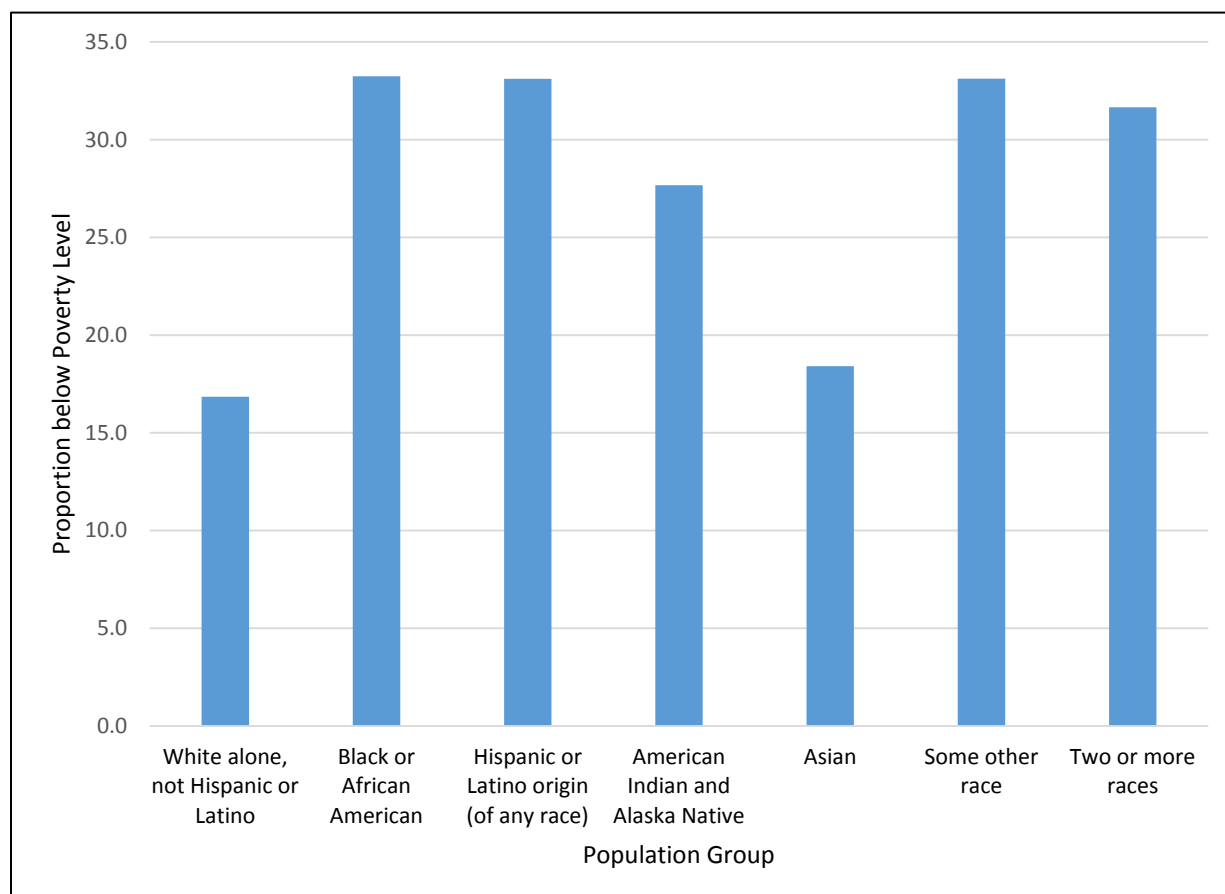


Figure 9: Mean Proportion of People below the Poverty Level across Counties in the TVA Service Area in 2016. Data from Census Bureau (2016b).

The above is consistent with national data. EIA (2018) notes that 31% of U.S. households faced challenges paying energy bills in 2015, and that low-income and minority households were more likely to face such challenges.

TVA does not have data within its service area on the distribution of energy use by households (only by monthly bills, as presented above in Figure 6 above). Information from the literature on energy use by income group is discussed below.

One study found that, on average, electricity use per household and per person in the Southern U.S. increases with annual household income (Figure 10).

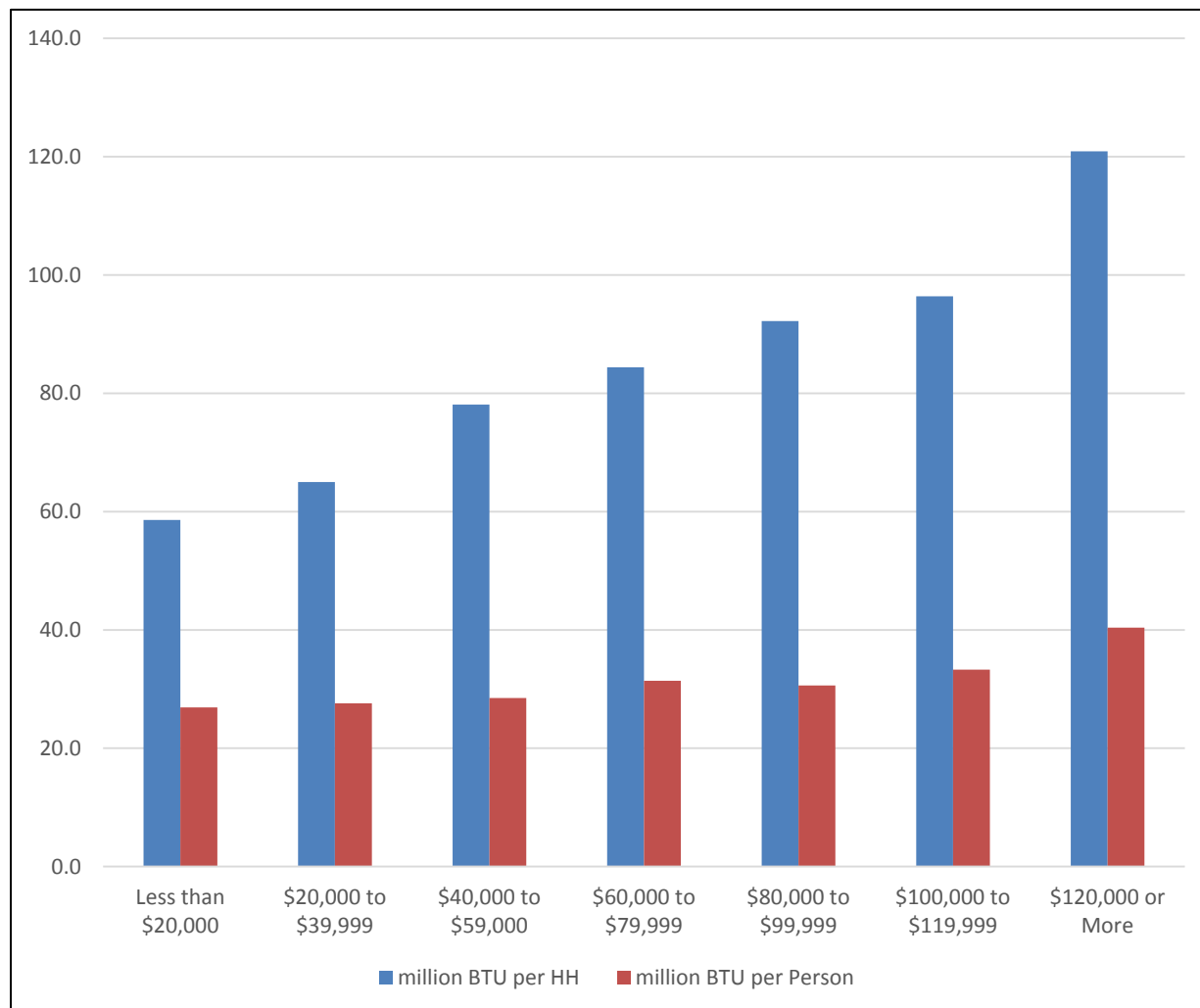


Figure 10: Electricity Use in the South by Household Income. Data from EIA (2012).

Other studies have found differing results. Berelson (2014) found that low-income households consumed 5 percent less than other households at one utility in the Eastern U.S., and 16 percent *more* electricity than other households at another. In a study of California households, CPUC (2012) found that while high income households use more electricity on average, there are low, medium, and high electricity consumers across all income groups.

Although the specific results of the above studies vary, the studies as a group suggest that the low-income households most vulnerable to electricity price increases are likely spread across different levels of electricity consumption.

3.3.2 Environmental Consequences

Alternative A (No Action)

Under this alternative, there would be no short-term changes in the rate structures or the way that TVA currently determines and applies electricity pricing.

TVA considers potential socioeconomic effects by three general groups of stakeholders: TVA and the LPCs it serves; residential customers; and nonresidential customers. In general, potential effects to TVA and LPCs would be financial, and potential effects on customers would be the result of changes in customers' electricity bills and/or changes in behavior resulting from price changes.

There would be no effects on energy use or socioeconomic impacts in the short term. However, the problems leading TVA to propose a rate change would likely worsen over time, including misalignment of revenue recovered and costs of service for different customer classes and cost shifting among customers due to DER installation. It is likely that LPCs would need to raise the monthly customer charge and/or energy rate at some point in the future. Therefore, Alternative A would have negative future effects on customers.

Large commercial customers served under General Service rate schedules would continue to pay significantly more than it costs to serve them and would continue to have less competitive rates and increased incentives to pursue uneconomic DER.

Alternative A would continue to have minor negative effects on most residential customers from cost shifting due to DER installation. While most types of DER provide benefits through increasing the use of clean renewable energy in the Tennessee Valley, it has costs as well.³ Under current electric rates, DER create cost-shifting from customers with DER (participants) to those without (non-participants). Retail consumers with DER connected to the grid currently offset retail electricity purchases at the retail energy rate. Because the retail energy rate is higher than TVA's marginal cost of providing electricity (even after accounting for avoided TVA costs), TVA effectively loses revenue on energy that DER send to the grid. Stated another way, the compensation paid for DER electricity is greater than the corresponding reduction in costs. Retail consumers who install DER that is not connected to the grid can reduce their energy usage from the TVA system, but that requires TVA and LPCs to raise rates in order to fully recover their costs, including the costs of assets installed to serve those customers. This would shift the costs to other customers. The future increase in rates would, if all else is equal, result in a higher incentive for DER installation, which would lead to more cost shifting.

Because most of TVA's costs of providing energy for Standard Service are recovered through variable energy charges rather than fixed charges, this means that DER prevents TVA from recovering its full costs from all customers connected to the system. This is not unique to TVA; a California Public Utility Commission report found that customers with DER on average pay just 81 percent of the cost to serve their electricity needs (CPUC, 2013).

As stated in section 1.1, TVA estimates that residential rooftop solar penetration of 2 percent (anticipated by TVA forecasters over the next decade) would equate to approximately 80,000 households. Higher use consumers would be more apt to pursue rooftop solar; at an average usage level of 2,500 kWh per month, the rooftop solar would displace approximately 30 percent of each such consumer's total usage. This usage at a residential effective rate of \$0.10 per kWh and a fuel cost of \$0.025 per kWh would result in a cost shifting of approximately \$54 million annually. Although residential rooftop solar is not the focus of the proposed wholesale rate change, those shifted costs over 10 years would result in over one-half of a billion dollars of unfair cost shifting to non-participants.

³ Some DER are based on fossil fuels, but the vast majority is solar or other clean renewable energy.

Of greater immediate concern are costs shifted from commercial and industrial customers. As described in section 1.1, a growing number of these customers are taking on sustainability goals and committing to purchase up to 100 percent of their energy resources from renewable resources, which without appropriate rate structure changes will unfairly shift costs to non-participants, including residential customers.

TVA has documented approximately 700 MW of currently installed behind-the-meter generation from gas fired generators, combined heat and power (CHP) plants, and solar installations. The current cost shifting is estimated to be around \$50 million, using conservative assumptions for energy production (generating reliably from 18 percent of installed capacity), a relatively low effective rate (\$0.075 per kWh), and a fuel rate of 2.5 cents. This would result in over \$300 million of unfair cost shifting by 2025.

TVA estimates that behind-the-meter solar generation for the residential and commercial sectors will double approximately every ten years. This would suggest that there would be approximately 500 MW of behind-the-meter solar generation in 2025. This trend in the growth of residential and commercial solar would result in an additional \$372 million in shifted cost by 2025. Thus, if TVA takes no action, the potential cost shifting in 2025 from solar technology alone, would be approximately \$100 million per year and growing rapidly.

Due to the costs of installing these generation systems, customers installing DER tend to have above-average incomes. The cost shifting therefore benefits households with above-average incomes but not the other households. Because customers without DER tend to be lower income households, continuing the current rate policies would result in lower income households paying increasing shares of the cost of residential electricity over time. These increased rates could potentially impose meaningful financial costs on the lowest income residential customers. For example, Auffhammer and Rubin (2018) find that low-income households react more to energy costs, heating their homes less than high-income households in winter. Because residences in the TVA service area are heated primarily with electricity, price increases may result in lower income households heating their homes to less than comfortable temperatures than they would have otherwise.

TVA's desire to avoid shifting costs to customers without DER is a primary reason why TVA has proposed a rate change. Applying a rate change would reduce the effects of DER cost-shifting while continuing to provide an incentive for DER investment.

An incidental drawback of Alternative A is that small-scale DER investments reduce the future incentive for utility-scale investment in renewable energy generation (including solar). Utility-scale renewable energy would cost substantially less per unit of energy than small-scale DER; therefore, more small-scale DER tend to increase the total costs of electricity in the region.

In summary, Alternative A would have some minor negative socioeconomic impacts.

Alternative B (Reducing the Wholesale Standard Service Energy Rate by 0.25¢ per kWh and Adding Corresponding Grid Access Charges)

TVA considers the combined effects of the various components of the rate change when analyzing socioeconomic impacts to end-use customers. There are six components of the proposed rate change that may have the potential to result in socioeconomic consequences: proposed changes to TVA's wholesale Standard Service rate structure; proposed changes to TVA's wholesale Non-Standard Service rate structure; proposed reductions to general service power rates for large commercial consumers; proposed modifications to the total monthly fuel

charge allocation methodology; proposed changes to retail power rates and their alignment with wholesale power rates; and the rebalancing of the hydro preference allocation adjustments.

TVA expects no negative financial effects on TVA and the LPCs due to the proposed change in wholesale Standard Service energy rates and introduction of a grid access charge, as the expected change would be revenue neutral for TVA, and analysis of the expected impacts to LPCs over a five-year period demonstrated that there would be no bill impact to LPCs (i.e., the average wholesale bill impact would be \$0). This alternative would recover approximately 4% of TVA's total fixed costs through a fixed grid access charge.

There would also be no expected socioeconomic effects resulting from changing resale rates to reflect changes in wholesale power costs and to improve the alignment of retail charges with the new wholesale charges under Alternative B. TVA expects that most LPCs would not alter their Standard Service retail rate structures under Alternative B because the change in the energy rates is small. Therefore, the socioeconomic effects on residential customers for Alternative B would be essentially the same as under Alternative A.

Alternative B would lower rates for large commercial customers by approximately 8 percent and slightly raise rates by approximately 0.3 percent for both Standard Service and large manufacturing customers, resulting in a mix of positive and negative financial effects for these customer classes. The rates for large commercial customers would be more competitive than the current conditions and the rates for both Standard Service and large manufacturing customers would continue to be competitive. The change would be beneficial to commercial customers and only mildly adverse to Standard Service and large manufacturing customers. These changes are expected to have negligible to minor economic effects for the TVA service area.

In its analysis, TVA found that there would be no expected socioeconomic effects resulting from improving fixed cost recovery from consumers with contract demands greater than 5,000 kW served under TOU Service rate schedules by implementing a new rate design. The change under Alternative B would be revenue neutral for TVA, and the bill impacts would be expected to fall within the -2 percent to +5 percent range of proposed structures currently under consideration by TVPPA and TVIC. Analysis of 6 proposed structures for a sample of approximately 50 large consumers has demonstrated that fewer than 10 percent would likely have bill impacts greater than 3 percent under any of the structures currently under consideration.

TVA also found that there would be no expected socioeconomic effects resulting from changing the wholesale rate schedule fuel cost adjustment resource cost allocation methodology to isolate the cost allocation weighting for large customers served under a manufacturing service rate from large customers served under a general service rate. The change would have no effect on Standard Service power rates and, thus, no effect on residential power rates. Isolating the large general service consumer allocation from the large manufacturing service consumer allocation would have the expected effect of increasing the effective power rates for large general service consumers by approximately 0.3 percent while decreasing the expected effective power rates for large manufacturing service consumers by 0.1 percent. The effect on the large general service consumers would be more than offset by the effects of the reduction in large general service power rates discussed above. The effect on the large manufacturing consumers would be so small as to be undetectable by analysis.

TVA proposes to rebalance the hydro allocation credits (which are distributed to residential

consumers) with the hydro allocation debits (which are collected from nonresidential consumers) to reflect the decrease in commercial and industrial sales. This rebalancing has the potential to affect all consumers. Based on the imbalance observed in the previous four fiscal years, there is likely to be no or minimal change to the distribution of credits to residential consumers and a \$30 million to \$40 million increase in the collection of debits from nonresidential consumers, spread evenly among all nonresidential consumers. The potential increase in rates for nonresidential consumers is estimated to be 0.6 percent. The expected decrease in kWh sales for nonresidential consumers resulting from the increase is 0.04 percent. Consequently, there would be no expected socioeconomic effects for the residential consumers because the level of credits distributed over the most recent four years has been at the Board-approved level of \$250 million annually, and the expected socioeconomic effects for nonresidential consumers would be negligible to minor.

Under Alternative B, the cumulative impact of the six components that have the potential for socioeconomic consequences would be an expected net 0.05 percent decrease in kWh sales.

Alternative C1 (Reducing the Wholesale Standard Service Energy Rate by 0.5¢ per kWh and Adding Corresponding Grid Access Charges)

The proposed changes to rate structures under Alternative C1 are mostly the same as those proposed under Alternative B, except the amounts of the changes to the Standard Service class would change. Under Alternative C1, the wholesale Standard Service energy rates would decrease by \$0.005 per kWh, greater than the decrease for Alternative B, and the grid access charge required to maintain revenue neutrality would be correspondingly higher.

As with Alternative B, TVA expects no negative effects to TVA or the LPCs due to the rate change being overall revenue neutral. Analysis of the expected impacts to LPCs over a five-year period demonstrated that the average wholesale bill impact for each LPC was zero. Due to the higher grid access charge, cost recovery for TVA would be more stable across months than under Alternatives A and B, a minor positive impact. The expected socioeconomic effects of the proposed wholesale rate change on the resale power rates are discussed in subsequent paragraphs. This alternative would recover approximately 8% of TVA's total fixed costs through a fixed grid access charge.

Potential effects on residential customers would be different under Alternative C1 than under Alternative B. TVA expects that most LPCs would change their Standard Service retail rates under Alternatives C1, C2 and D. As previously discussed, LPCs would have three approaches to changing their retail rates. TVA expects that the effects of the various options would be similar and performed the analysis below assuming that all LPCs adopt LPC-specific default rates developed by TVA. The proposed default rates would provide for no change to the monthly customer charge, a \$0.002 increase in the existing energy rate for both the first 500 kWh and the second 500 kWh consumed in a month, and a slight decrease in the existing energy rate for electricity over 1,000 kWh in a month.

This change would affect residential households and small businesses differently depending on how much electricity they typically consume in a month. The current monthly customer charges and energy rates vary across LPCs in TVA's service area, and are close to \$18.41 per month and \$0.0895 per kWh on average, respectively. Table 4 illustrates how monthly bills would change assuming these average values for current rates and new rates under Alternative C1 of \$0.0915 per kWh for the first 1,000 kWh and \$0.08571 per kWh for the remaining kWh.

Monthly Electricity Used (kWh)	Current Monthly Bill (\$)	Monthly Bill under Alternative C1 (\$)	Difference (\$)	Percent Increase
250	\$40.79	\$41.29	\$0.50	1.2%
500	\$63.16	\$64.16	\$1.00	1.6%
1000	\$107.91	\$109.91	\$2.00	1.9%
1500	\$152.66	\$152.77	\$0.10	0.1%
2000	\$197.41	\$195.62	-\$1.79	-0.9%
2500	\$242.16	\$238.48	-\$3.69	-1.5%

Table 4: Illustrative Changes in Monthly Standard Service Bills under Alternative C1

As shown in Table 4, the differences in monthly bills are small for a wide range of electricity use, both as absolute amounts (no more than a \$2 increase) and as percent changes (no more than a 1.9 percent increase). The maximum increase occurs for households that use exactly 1,000 kWh in a month. Over 1,500 kWh, monthly bills would decrease. Figure 11 below shows the anticipated changes in monthly bills based on the percentage of change. The expected decrease for particularly high-usage bills would be about 4 percent.

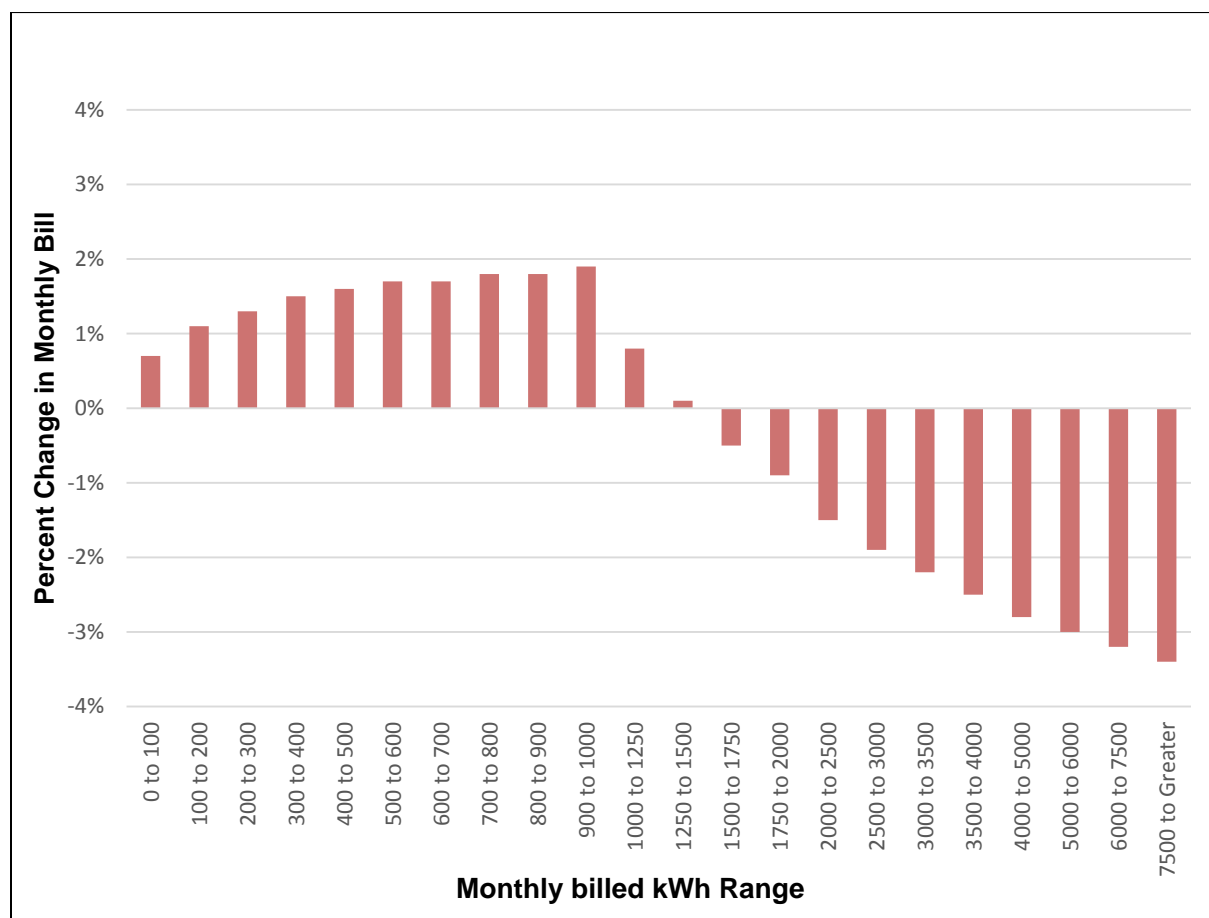


Figure 11: Percent Change in Standard Service Monthly Bills under Alternative C1.

TVA estimates that the majority of bills (70 percent) would have small increases. Overall, about 40% of monthly retail residential bills would be between \$1.00 and \$2.00 higher, about 30% would be less than \$1.00 higher, and about 30% would be lower. Those with bills less than 500kWh (18% of all bills) would have an average increase of less than \$1.00 per month. Those with bills between 500 and 1000 kWh in a month (approximately 30 percent of total

bills), would have increases between \$1.00 and \$2.00 per month. Those with bills between 1,000 and 1,500 kWh in a month (23% of bills) would have an average increase of less than \$1.00 a month. Those with bills higher than 1,500 kWh in a month (29% of bills) would have decreases. The lower use households generally would see negative impacts and high use households would have a small benefit.

A difference in Alternative C1 compared to Alternative A that is not reflected in the calculations above is that for any particular household, the differences may vary throughout the year depending on the season and weather. For example, a household may use more than average electricity during the coldest and warmest months, and less than average electricity in other months. TVA data indicates that electricity use during the three summer and three winter months is about twice the use in the other six months of the year. In this case, the household's electricity bills would decrease under Alternative C1 (and C2) compared to Alternative A in the colder and warmer months, and would increase in the other months. This additional stability in bill amounts across the seasons results in a potential benefit, relative to having more fluctuation in bills, to all households. This benefits low-income households more than other households, because the higher peak bills in winter or summer can result in financial hardships.

As previously noted in section 3.3.1, households of all income categories can be low, moderate, or high energy users. Therefore, any negative impacts of the small bill increases would be spread across all income and socioeconomic groups, and would not be borne by any one particular income or other socioeconomic group. The maximum increase would be about \$24 per household per year (affecting up to 40% of residential customers). TVA recognizes that the amount could be a problem for some low-income households. Overall, however, such an increase represents a minor change for the vast majority households in TVA's service area.

The above calculations assume for purposes of illustration that households would not change the energy consumed in response to the change in prices. However, it is expected that some households would change the amount of electricity consumed as prices change. TVA estimates that for each 1 percent increase in the total monthly bill, households will reduce consumption by 0.15 percent. For example, for a bill increase of 2 percent, electricity consumed would decrease by 0.3 percent. Alternative C1 may therefore slightly reduce electricity consumed by lower-use and average-use households and a slight increase in electricity use for higher-use households. Combined, the overall change in residential electricity use is expected to be small.

Alternative C1 would slightly change the incentives for installing DER. Sigrid and Drury 2013 notes that customers consider a number of factors, including the payback period and the monthly savings, when considering whether or not to install DER. TVA estimates that the net cost of a typical residential solar installation of 5 kW installation is \$9,800.⁴ Using the current average retail rate of \$0.0895 per kWh, the payback period is approximately 15 years; under Alternative C1 with an expected future average rate of \$0.08547 per kWh, the payback period would be 16 years.⁵ Because the changes in rates are small, there would be little change in

⁴ Assumes an installed cost of \$2.80 per kW (Fu 2017) and a 30% federal tax credit.

⁵ The capacity factor for residential solar in the TVA service area is estimated as 18% (see TVA's Solar FAQ's (TVA 2018b). Annual generation is estimated at 7,884 kWh in the first year of operation and panel performance degradation is assumed at 0.5% per year for each subsequent year of the 25 year life of the project. TVA assumes that all electricity generated is either self-consumed or sold back to the grid at the current average retail rate (\$0.0895 per kWh), and future average rates are approximated as \$0.08547 per kWh.

the amount that could be saved per month from installing DER. Based on the information in Sigrin and Drury (2013), this is expected to result in a marginal reduction in the number of people who choose to install DER.⁶

The expected socioeconomic effects of (1) the proposed changes to TVA's wholesale Non-Standard Service rate structure; (2) the proposed reductions to general service power rates for large commercial consumers; (3) the proposed modifications to the total monthly fuel charge allocation methodology; and (4) the rebalancing of the hydro preference allocation adjustments would be the same under Alternative C1 as under Alternative B as discussed above.

Under Alternative C1, TVA estimates that there would be an expected increase in Standard Service sales of approximately 0.04 percent due to changes in the Standard Service resale rate structures. The cumulative impact of the six components that have the potential for socioeconomic consequences would be an expected net decrease in sales 0.01 percent under Alternative C1.

Alternative C2 (Reducing the Wholesale Standard Service Energy Rate by 1¢ per kWh and Adding Corresponding Grid Access Charges)

The proposed changes to rate structures under Alternative C2 are mostly the same as those proposed under Alternative B and C1, except the amounts of the changes to the Standard Service class would change. Under Alternative C2, the wholesale Standard Service energy rates would decrease by \$0.01 per kWh, greater than the decrease for Alternatives B and C1, and the grid access charge required to maintain revenue neutrality would be correspondingly higher. Although the energy rate decrease and grid access charge would be greater under Alternative C2 (\$0.01 per kWh) as that proposed under Alternative C1 (\$0.005 per kWh), the anticipated effects of the two alternatives would be substantially the same.

As with Alternatives B and C1, TVA expects no negative effects to TVA or the LPCs due to revenue neutrality; over a five-year period demonstrated the average wholesale bill impact for each LPC would be zero. Due to the higher grid access charge, cost recovery for TVA would be more stable across months than under Alternatives A and B, a minor positive impact. This alternative would recover approximately 16% of TVA's total fixed costs through a fixed grid access charge. The expected socioeconomic effects of the proposed wholesale rate change on the resale power rates are discussed in subsequent paragraphs.

Potential effects on residential customers would be similar to Alternative C1. TVA expects that most LPCs would change their Standard Service retail rates under Alternative C2, and that LPCs would implement one of three approaches to changing their retail rates. TVA expects that the effects of the various options would be similar and performed the analysis below assuming that all LPCs adopt LPC-specific default rates developed by TVA. The proposed default rates would provide for no change to the monthly customer charge, a \$0.002 increase in the existing energy rate for both the first 500 kWh and second 500 kWh consumed in a month, and a slight decrease in the existing energy rate for electricity over 1,000 kWh in a month.

Like Alternative C1, this change would affect residential households and small businesses differently depending on how much electricity they typically consume. Table 5 illustrates how

⁶ See Figures 3 and 4 therein.

monthly bills would change assuming these average values for current rates and new rates under Alternative C2 of \$0.0915 per kWh for the first 1,000 kWh and \$0.08571 per kWh for the remaining kWh.

Monthly Electricity Used (kWh)	Current Monthly Bill (\$)	Monthly Bill under Alternative C2 (\$)	Difference (\$)	Percent Increase
250	\$40.79	\$41.29	\$0.50	1.2%
500	\$63.16	\$64.16	\$1.00	1.6%
1000	\$107.91	\$109.91	\$2.00	1.9%
1500	\$152.66	\$152.77	\$0.10	0.1%
2000	\$197.41	\$195.62	-\$1.79	-0.9%
2500	\$242.16	\$238.48	-\$3.69	-1.5%

Table 5: Illustrative Changes in Monthly Standard Service Bills under Alternative C2

Table 5 shows the same changes for Alternative C2 as Table 4 shows for Alternative C1. As with Alternative C1, differences in monthly bills are small for a wide range of electricity use, both as absolute amounts (no more than a \$2 increase) and as percent changes (no more than a 1.9 percent increase). The maximum increase occurs for households that use exactly 1,000 kWh. Over 2,000 kWh, monthly bills would decrease.

Figure 12 below shows these anticipated changes in monthly bills based on the percentage of change. Figure 12 for Alternative C2 reflects the same changes as Figure 12 for Alternative C1.

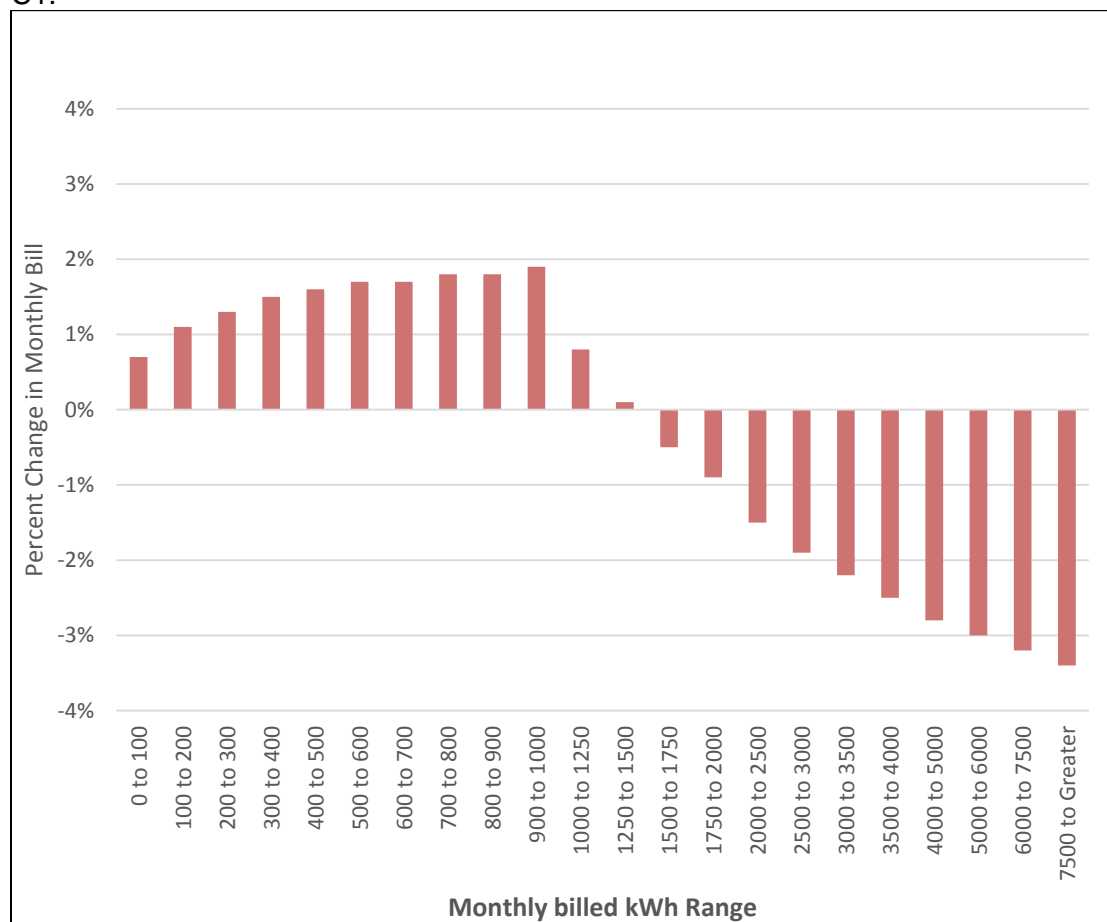


Figure 12: Percent Change in Standard Service Monthly Bills under Alternative C2

For any particular household, differences in billing may vary throughout the year depending on the season and weather. For example, a household may use more than average electricity during the coldest and warmest months, and less than average electricity in other months. TVA data indicates that electricity use during the three summer and three winter months is about twice the use in the other six months of the year. In this case, the household's electricity bills would decrease under Alternatives C1 and C2 compared to Alternative A in the colder and warmer months, and would increase in the other months. This benefits low-income households more than other households, because the higher peak bills in winter or summer can result in financial hardships.

Like Alternative C1, about 40% of monthly retail residential bills would be between \$1.00 and \$2.00 higher, about 30% would be less than \$1.00 higher, and about 30% would be lower. Thus, the maximum increase of about \$24 per household per year would affect up to 40% of residential customers. Such an increase represents a minor change for the vast majority households in TVA's service area. However, this amount could be a problem for some low-income households.

The above calculations assume for the purposes of example that households would not change the energy consumed in response to the change in prices. However, TVA expects that some households would change the amount of electricity consumed as prices change. TVA

estimates that for each 1 percent increase in the total monthly bill, households will reduce consumption by 0.15 percent. For example, for a bill increase of 2 percent, electricity consumed would decrease by 0.3 percent. Alternative C2 would therefore slightly reduce electricity consumed by lower-use and average-use households and a slight increase in electricity use for higher-use households. Similar to Alternative C1, the overall combined change in residential electricity use is expected to be small.

Similar to Alternative C1, Alternative C2 would slightly change the economic incentives for installing DER because customers consider a number of factors, including the payback period and the monthly savings, when considering whether or not to install DER. TVA expects that at the slightly lower energy rate, this might be extended to 16 years under Alternative C2, same as Alternative C1. Because the changes in rates are small, there would be little change in the amount that could be saved per month from installing DER. This is expected to result in a marginal reduction in the number of people who choose to install DER (Sigrin and Drury 2013).

The expected socioeconomic effects of (1) the proposed changes to TVA's wholesale Non-Standard Service rate structure; (2) the proposed reductions to general service power rates for large commercial consumers; (3) the proposed modifications to the total monthly fuel charge allocation methodology; and (4) the rebalancing of the hydro preference allocation adjustments would be the same under Alternative C2 as under Alternatives B and C1, as discussed above.

Like Alternative C1, TVA estimates that under Alternative C2 there would be an expected increase in Standard Service sales of approximately 0.04 percent due to changes in the Standard Service resale rate structures. The cumulative impact of the six components that have the potential for socioeconomic consequences would be an expected net decrease in sales 0.01 percent under Alternative C2.

Alternative D (Reducing the Wholesale Standard Service Energy Rate by 2.5¢ per kWh and Adding Corresponding Grid Access Charges)

Socioeconomic effects under Alternative D would be the same as Alternatives C1 and C2, except that the changes in Standard Service wholesale energy rates would be larger (a reduction of \$0.025 compared to \$0.01), as would the corresponding grid access charge. Alternative D would provide reduced risk for TVA customers resulting from cost shifting compared to Alternatives C1 and C2 due to the larger energy rate reductions with corresponding higher grid access charges. While TVA's proposed default resale rates would be similar under Alternative D as under Alternatives C1 and C2, the larger change in wholesale rate structure to LPCs would provide additional incentive for LPCs to pursue customized rate structures. This alternative would recover approximately 40% of TVA's total fixed costs through a fixed grid access charge.

There would be an expected increase in Standard Service kWh sales of approximately 0.04 percent due to changes in the Standard Service resale rate structures. The cumulative impact of the six components that have the potential for socioeconomic consequences would be an expected net 0.01 percent decrease in kWh sales under Alternative D. Therefore, all potential socioeconomic impacts on end customers are expected to be similar to Alternatives C1 and C2, but with the potential for larger effects on households depending on how many LPCs pursue customized rate structures. Investment in DER would be slowed slightly more than under Alternatives C1 and C2.

Changes in monthly Standard Service bills under Alternative D are expected to be the same

as under Alternatives C1 and C2 (see Tables 4 and 5 and Figures 11 and 12).

3.4 Energy Production and Use

3.4.1 Affected Environment

TVA is the largest public power supplier in the United States. Dependable generating capacity on the TVA system is approximately 37,000 megawatts (MW). TVA generates most of this electricity with 3 nuclear plants, 7 coal-fired plants, 9 simple-cycle combustion turbine plants, 7 combined-cycle plants, 29 hydroelectric dams, a diesel generator plant, a pumped storage plant, a methane-gas co-firing facility, a windfarm, and 16 small photovoltaic facilities (TVA 2017). A portion of delivered power is also provided through long-term power purchase agreements. TVA transmits electricity from these facilities over 16,000 circuit miles of transmission lines. Like other utility systems, TVA has power interchange agreements with utilities surrounding its region and purchases and sells power on an economic basis almost daily.

Consumers of TVA-generated electricity consist of a mix of residential, commercial, and industrial customers in the power service area. Recent (2009–2017) energy sales totaled between 133,000 and 161,000 gigawatt-hours (GWh) annually, with sales in fiscal year 2017 of 152,352 GWh. The sales included those to the 154 distributors serving residential, commercial, and industrial customers and 57 directly served large industrial customers and federal installations. In 2017, 25 percent of TVA's power supply was from coal; 38 percent from nuclear; 16 percent from natural gas; 9 percent from non-renewable purchases; 7 percent from hydro; and 5 percent from renewable power purchase agreements.

Although TVA's 2015 IRP study found that that both peak demand and energy demand in the TVA Power Service Area would grow at relatively steady rates into the future (averaging 1.1 and 1.0 percent per year, respectively), more recent predictions indicate that the forecasted load is expected to be flat or even declining slightly, over the next decade. The most recent TVA data and current outlook (TVA 2017) indicate that peak demand and energy demand in the TVA Power Service Area will grow at relatively flat rates, averaging 0.1 and -0.1 percent per year, respectively. These more recent predictions indicate a slightly slower rate for peak and energy demand than was predicted in TVA (2015). In both TVA (2015) and the TVA (2017), bounding scenarios for power planning were analyzed with both greater and lesser growth rates.

When forecasting load demand, TVA must consider how changes to its rate structure may influence demand. The effects of a price change can be gauged by estimating how demand for a product changes as a result of a change in price ($\text{Price Elasticity} = \% \text{ Change in Quantity} / \% \text{ Change in Price}$). In other words, for every 1 percent change in price, consumer demand will change by a certain percentage. Price can be an important driver that explains changes in demand. This estimation is usually done with a statistical regression that controls for changes in historical weather, economics and end-uses, which then isolates the effects of price changes directly.

Based on analysis of TVA's historical price response, the price elasticity in the TVA region is estimated to be -0.15 percent; that is, for every 1 percent increase in bill, TVA expects to see a 0.15 percent decrease in electricity consumption and vice versa.⁷ As consumers gain more

⁷ This estimate is supported by studies highlighted in Bernstein and Griffin (2006), notably the mean of

information about their energy consumption and better technology to manage it, price elasticity may change over time since consumers have greater opportunities to alter their appliance and lighting choices.

TVA currently has approximately 7,500 MW of renewable energy sourced from approximately 3,200 locations, which puts TVA in the 1st (top) quartile for the percent of utility-scale renewable generation compared to regional peers, and at or above the national median for the amount of distributed generation capacity and average capacity factors for biomass, solar, and wind.

In 2012, there were 1,186 renewable generating systems with a total combined capacity of about 67 MW (DC). (TVA 2015 IRP) Through May 2015, participation had increased to 2,400, with the participation by technology type shown in Table 6 below.

Technology	Residential	Commercial	Total
Solar < 20 kW	1,252	354	1,606
Solar > 20 kW	111	639	750
Wind	19	10	29
Biomass, Landfill Gas	0	10	10
Biomass	0	3	3
Biomass, Wastewater Gas	0	1	1
Low Impact Hydro	0	1	1
Total	1,382	1,018	2,400

Table 6. Green Power Providers Participation by Technology Type, May 2015

Through January 2018, there were more than 3,300 installations with a capacity of about 106 MW, with about 90 percent of the capacity from solar photovoltaic energy systems. Although participation in the program increased approximately 38 percent between May 2015 and January 2018, the overall capacity generated from these resources remains very small, at about 0.2 percent of TVA's total generation capacity. Since 2015, TVA has incorporated a distributed solar forecast in its load outlook. As stated in Section 3.3.2 above, TVA forecasting specialists estimate that DER will increase over time, with 2 percent of households in the Tennessee Valley expected to have DER (primarily solar) installations by 2030.⁸

3.4.2 Environmental Consequences

As noted in Section 3.1, a potential source of environmental impacts results if directly served customers or LPC-served customers increase or decrease their energy use in response to TVA's restructuring of power rates to the extent that TVA must construct new generation

estimates found in Maddala et al (1997) and Garcia-Cerrutti (2000).

⁸ In 2017, TVA estimated that the 2% rate would be achieved within 10 years. After a 30% tariff on imported solar photovoltaic systems was implemented by executive action of the President in January 2018, TVA estimated that the rate of adoption would slow slightly during the 4 years that tariffs are applied, delaying the 2% adoption rate by one to two years.

facilities, change its operation of existing facilities (either more or less), or alter its mix of energy resources, in response to this change in energy use. With increases or decreases in energy demand, more or less transmission capability may also be needed. This section provides analysis of the potential for each rate change alternative to result indirectly in changes to TVA operations. TVA notes that such an analysis involves speculation, especially given that the potential for effects depend on numerous decisions to be made by intervening persons and entities outside TVA's control.

Alternative A (No Action)

Under this alternative, there would be no change in the way TVA currently determines and applies pricing for electricity or the related products, credits and adjustments. Therefore, there would be no short-term effects on energy use.

In the long run, however, TVA may be required to adjust its rates in a manner to address the revenue deficit that may result from flat to declining sales. Adjustments that increase costs to LPCs and consumers may result in changes in behavior and result in the need for TVA to alter its generation, although the extent of such changes remain speculative at this time.

Alternative B (Reducing the Wholesale Standard Service Energy Rate by 0.25¢ per kWh and Adding Corresponding Grid Access Charges)

Six components of the proposed rate change have the potential to result in environmental consequences because they may influence energy use by consumers: proposed changes to TVA's wholesale Standard Service rate structure; proposed changes to TVA's wholesale Non-Standard Service rate structure; proposed reductions to general service power rates for large commercial consumers; proposed modifications to the total monthly fuel charge allocation methodology; proposed changes to retail power rates and their alignment with wholesale power rates; and the rebalancing of the hydro preference allocation adjustments.

Under Alternative B, TVA would reduce wholesale Standard Service energy rates by 0.25 cents per kWh and introduce a wholesale grid access charge that would recover an equivalent amount of revenue. There would be no expected environmental effects due to reducing wholesale Standard Service energy rates by 0.25 cents and introducing a wholesale grid access charge that would recover an equivalent amount of revenue. The change would be revenue neutral for TVA. An analysis of the expected impacts to LPCs over a five-year period demonstrated that the average wholesale bill impact for each LPC would be zero. The expected environmental effects of the proposed wholesale rate change under Alternative B to the resale power rates are discussed in subsequent paragraphs.

There would be no expected environmental effects due to improving fixed cost recovery from consumers with contract demands greater than 5,000 kW served under TOU Service rate schedules by implementing a new rate design under this alternative. The change would be revenue neutral for TVA. TVA analysis indicates that the bill impacts would be expected to fall within the -2 percent to +5 percent range of proposed structures previously presented to TVPPA and TVIC. Analysis of six proposed structures for a sample of approximately 50 large consumers has demonstrated that fewer than 10 percent would likely have bill impacts greater than 3 percent under any of the structures previously presented. There are no expected changes in total sales or generation related to the proposed structures under this alternative.

Likewise, no impacts to the environment would result from decreasing wholesale TOU Service energy rates under rate schedules General Service B, C, and D by \$23 million and increasing wholesale Standard Service rates and TOU manufacturing service rates approximately 0.3 percent to maintain TVA revenue neutrality. Analysis of the expected changes in sales due to

the decreases in large general service power rates and the increases in the Standard Service and large manufacturing service power rates indicates that there would be a less than 0.01 percent decrease in total TVA generation to supply the associated sales.

There would also be no environmental impacts of changing the wholesale rate schedule fuel cost adjustment resource cost allocation methodology to isolate the cost allocation weighting for large customers served under a manufacturing service rate from large customers served under a general service rate. The change would have no effect on Standard Service power rates, and, thus no effect on residential power rates. The effects of isolating the large general service consumer allocation from the large manufacturing service consumer allocation would have the expected effect of increasing the effective power rates for large general service consumers by approximately 0.3 percent while decreasing the expected effective power rates for large manufacturing service consumers by 0.1 percent. Analysis of the expected changes in sales due to the increase in effective large general service rates and the decrease in effective large manufacturing service rates indicates that there would be an approximately 0.002 percent increase in generation to supply the associated sales.

No environmental effects would result from changing resale rates to reflect changes in wholesale power costs and to improve the alignment of retail charges with the new wholesale charges. A reduction in wholesale Standard Service energy rates of 0.25 cents and the introduction of a wholesale grid access charge that would recover an equivalent amount of revenue would not be a change of sufficient magnitude to cause TVA to seek to restructure resale rates. The current resale rates would likely continue to remain in effect. There would be no expected change in sales or in generation.

Finally, there would no environmental impacts from rebalancing the hydro allocation credits distributed to residential consumers with the hydro allocation debits collected from nonresidential consumers to reflect the decrease in commercial and industrial sales. Based on the imbalance observed in the previous four fiscal years, there is likely to be minimal change in the distribution of credits to residential consumers corresponding to a \$30 million to \$40 million increase in the collection of debits from nonresidential consumers, spread evenly among all nonresidential consumers. Analysis of the expected changes in sales due to the approximately 0.6 percent increase in the effective rates for nonresidential consumers indicates that there would be an approximately 0.04 percent decrease in generation to supply the associated sales.

Cumulatively, the primary components of rate change under Alternative B would be very minor. Alternative B would not require TVA to change its operations or alter its generation and transmission systems. The economic effect is unlikely to influence the rate of investment in DER among retail consumers. TVA does not anticipate any direct, indirect or cumulative impacts.

Alternative C1 (Reducing the Wholesale Standard Service Energy Rate by 0.5¢ per kWh and Adding Corresponding Grid Access Charges)

The six components of the proposed rate change under Alternative C1 that have the potential to impact the environment are the same as those discussed under Alternative B: proposed changes to TVA's wholesale Standard Service rate structure; proposed changes to TVA's wholesale Non-Standard Service rate structure; proposed reductions to general service power rates for large commercial consumers; proposed modifications to the total monthly fuel charge allocation methodology; proposed changes to retail power rates and their alignment with wholesale power rates; and the rebalancing of the hydro preference allocation adjustments.

As shown in Table 7 below, TVA's analysis of price elasticity indicates that the total expected change in power sales (kWh) as a result of changing these six components under Alternative C1 would be a minor decrease of 0.01 percent of those sales. The decrease is negligible and would not result in any alterations of TVA operations and would not require any changes to TVA's generation and transmission systems. The resulting change in energy use is well within the boundaries for energy use in planning scenarios analyzed in TVA (2011) and TVA (2015). This level of change (bounded by the 2011 and 2015 analyses) would be minor and the only likely result is a slight reduction in TVA purchases of energy from other sources or a minor reduction in total energy production from TVA generating facilities.

Of the six components identified above, the potential energy use effects of the proposed changes to TVA's wholesale Non-Standard Service rate structure, proposed reductions to general service power rates for large commercial consumers, proposed modifications to the total monthly fuel charge allocation methodology, and the rebalancing of the hydro preference allocation adjustments would be the same under Alternative C1 as under Alternative B.

There would be no expected energy use effects due to reducing wholesale Standard Service energy rates by 0.5 cents and introducing a wholesale grid access charge that would recover an equivalent amount of revenue. The change would be revenue neutral for TVA, and analysis of the expected impacts to LPCs over a five-year period demonstrated that there would be no impact on the average wholesale bill for each LPC.

The negligible decrease of 0.01 percent in energy use resulting from the proposed rate change under Alternative C1 is not expected to have significant net impacts to TVA power supply requirements. Other factors affecting TVA power supply requirements such as weather conditions and the level of economic activity are expected to have much larger influence on TVA energy production. Because of the degree of uncertainty regarding customer response and the expected minor magnitude of any such response, TVA forecasters would not alter the demand or energy requirements forecast as a result of proposed rate structure changes.

The economic effect of Alternative C1, addressed above, would marginally slow the rate of investment in DER among retail consumers. However, TVA does not expect that such a minor slowing of investment in DER would result in any discernible increases in operations of its own generating resources, or in the alteration of its generation and transmission systems. TVA does not anticipate any direct, indirect or cumulative impacts.

Table 7. Alternative C1 Price Elasticity Analysis and Potential Change To TVA Power Sales

ALTERNATIVE C1 ANALYSIS OF PRICE ELASTICITY	Standard Service		Large General Service	Large Manufacturing Service	Total kWh	% Change in kWh Sales
	Residential	Small C&I				
FY 2016 kWh Sales	63,147,047,691	54,504,212,007	4,220,782,935	33,653,180,522	155,525,223,155	
Wholesale Standard Service: The change would be revenue neutral to TVA. Elasticity analysis indicates no expected change in sales volume.	0*	0	0	0	0	0.00%
Wholesale Non Standard Service: The change would be revenue neutral for TVA. Elasticity analysis indicates no expected change in sales volume.	0	0	0	0	0	0.00%
General Service Rates for Large Consumers: Decrease wholesale TOU Service energy rates under schedules General Service B, C, and D by \$23 million and to increase wholesale Standard Service rates and TOU manufacturing service rates approximately 0.3% to maintain TVA revenue neutrality. Elasticity analysis indicates a very small net decrease in kWh sales.	(20,131,096)	(18,288,230)	32,434,440	(7,326,356)	(13,311,243)	(0.01%)
Total Monthly Fuel Charge: Change the wholesale rate schedule fuel cost adjustment resource cost allocation methodology to isolate the cost allocation weighting for large customers served under a manufacturing service rate from large customers served under a general service rate. Elasticity analysis indicates a net change in kWh sales that approaches zero.	1,382,152	1,255,625	(1,220,496)	2,322,956	3,740,237	0.00%
Retail Rates: Change resale rates to reflect changes in wholesale power costs and to improve the alignment of retail charges with the new wholesale charges.	30,907,792	31,672,343	0	0	62,580,135	0.04%
Hydro Preference Allocation Rebalancing: No change to residential hydro allocation credits or residential sales volume is expected. Elasticity analysis indicates that the increase in the effective rates for non residential consumers will result in a 0.04% decrease in total sales volume.	0	(38,095,016)	(2,410,145)	(26,985,056)	(67,490,217)	(0.04%)
Total Expected Change in Sales Volume	12,158,848	(23,455,279)	28,803,799	(31,988,456)	(14,481,088)	(0.01%)

* The zero inserted for Wholesale Standard and Non Standard Service denotes that the changes at wholesale are unlikely to prompt or incent any changes by LPCs in their behavior.

Alternative C2 (Reducing the Wholesale Standard Service Energy Rate by 1¢ per kWh and Adding Corresponding Grid Access Charges)

Similar to Alternatives B and C1, six components of the proposed rate change under Alternative C2 have the potential to impact the environment: proposed changes to TVA's wholesale Standard Service rate structure; proposed changes to TVA's wholesale Non-Standard Service rate structure; proposed reductions to general service power rates for large commercial consumers; proposed modifications to the total monthly fuel charge allocation methodology; proposed changes to retail power rates and their alignment with wholesale power rates; and the rebalancing of the hydro preference allocation adjustments.

Similar to Alternative C1, TVA's analysis of price elasticity indicates that the total expected change in power sales (kWh) as a result of changing these six components would be a minor decrease of 0.01 percent of those sales. The effects of Alternative C2 would be the same as Alternative C1. See Table 8 below. The decrease is negligible and would not result in any alterations of TVA operations and would not require any changes to TVA's generation and transmission systems.

Of the six components identified above, the potential energy use effects of the proposed changes to TVA's wholesale Non-Standard Service rate structure, proposed reductions to general service power rates for large commercial consumers, proposed modifications to the total monthly fuel charge allocation methodology, and the rebalancing of the hydro preference allocation adjustments would be the same under Alternatives B, C1 and C2.

There would be no expected energy use effects due to reducing wholesale Standard Service energy rates by 1 cent and introducing a wholesale grid access charge that would recover an equivalent amount of revenue. The change would be revenue neutral for TVA, and analysis of the expected impacts to LPCs over a five-year period demonstrated that there would be no impact on the average wholesale bill for each LPC.

As under Alternative C1, the negligible decrease of 0.01 percent in energy use resulting from the proposed rate change under Alternative C2 is not expected to have significant net impacts to TVA power supply requirements. Other factors affecting TVA power supply requirements such as weather conditions and the level of economic activity are expected to have much larger influence on TVA energy production. Because of the degree of uncertainty regarding customer response and the expected minor magnitude of any such response, TVA forecasters would not alter the demand or energy requirements forecast under Alternative C2.

The economic effect of Alternative C2 is the same as Alternative C1. Although marginal slowing of investment in DER may occur, TVA does not expect that such a minor slowing of investment in DER would result in any discernible increases in operations of its own generating resources, or in the alteration of its generation and transmission systems. TVA does not anticipate any direct, indirect or cumulative impacts.

Table 8. Alternative C2 Price Elasticity Analysis and Potential Change To TVA Power Sales

ALTERNATIVE C2 ANALYSIS OF PRICE ELASTICITY	Standard Service		Large General Service	Large Manufacturing Service	Total kWh	% Change in kWh Sales
	Residential	Small C&I				
FY 2016 kWh Sales	63,147,047,691	54,504,212,007	4,220,782,935	33,653,180,522	155,525,223,155	
Wholesale Standard Service: The change would be revenue neutral to TVA. Elasticity analysis indicates no expected change in sales volume.	0*	0	0	0	0	0.00%
Wholesale Non Standard Service: The change would be revenue neutral for TVA. Elasticity analysis indicates no expected change in sales volume.	0	0	0	0	0	0.00%
General Service Rates for Large Consumers: Decrease wholesale TOU Service energy rates under schedules General Service B, C, and D by \$23 million and to increase wholesale Standard Service rates and TOU manufacturing service rates approximately 0.3% to maintain TVA revenue neutrality. Elasticity analysis indicates a very small net decrease in kWh sales.	(20,131,096)	(18,288,230)	32,434,440	(7,326,356)	(13,311,243)	(0.01%)
Total Monthly Fuel Charge: Change the wholesale rate schedule fuel cost adjustment resource cost allocation methodology to isolate the cost allocation weighting for large customers served under a manufacturing service rate from large customers served under a general service rate. Elasticity analysis indicates a net change in kWh sales that approaches zero.	1,382,152	1,255,625	(1,220,496)	2,322,956	3,740,237	0.00%
Retail Rates: Change resale rates to reflect changes in wholesale power costs and to improve the alignment of retail charges with the new wholesale charges.	30,907,792	31,672,343	0	0	62,580,135	0.04%
Hydro Preference Allocation Rebalancing: No change to residential hydro allocation credits or residential sales volume is expected. Elasticity analysis indicates that the increase in the effective rates for non residential consumers will result in a 0.04% decrease in total sales volume.	0	(38,095,016)	(2,410,145)	(26,985,056)	(67,490,217)	(0.04%)
Total Expected Change in Sales Volume	12,158,848	(23,455,279)	28,803,799	(31,988,456)	(14,481,088)	(0.01%)

* The zero inserted for Wholesale Standard and Non Standard Service denotes that the changes at wholesale are unlikely to prompt or incent any changes by LPCs in their behavior.

Alternative D (Reducing the Wholesale Standard Service Energy Rate by 2.5¢ per kWh and Adding Corresponding Grid Access Charges)

Under Alternative D, TVA would reduce wholesale Standard Service energy rates by 2.5 cents per kWh and would introduce a wholesale grid access charge that would recover an equivalent amount of revenue. The six components of the proposed rate change that may have environmental consequences are the same as previously identified for Alternatives B, C1 and C2.

TVA's analysis of price elasticity indicates that the change in power sales under Alternative D would be the same as the change under Alternatives C1 and C2. See Table 9 below. The 0.1 percent decrease is negligible and would not result in any alterations of TVA operations and would not require any changes to TVA's generation and transmission systems.

As shown in the table, under Alternative D, there would be no effects resulting from reducing wholesale Standard Service energy rates by 2.5 cents and introducing a wholesale grid access charge that would recover an equivalent amount of revenue. The change would be revenue neutral for TVA. TVA's analysis of the expected impacts to LPCs over a five-year period demonstrated that there would be no bill impact on the average wholesale bill for each LPC by altering the wholesale Standard Service energy rate as proposed under Alternative D. TVA does not foresee, therefore, that the wholesale rate change would result in change to energy use.

Likewise, the expected energy use effects of the proposed changes to TVA's wholesale Non-Standard Service rate structure; proposed reductions to general service power rates for large commercial consumers; proposed modifications to the total monthly fuel charge allocation methodology; and the rebalancing of the hydro preference allocation adjustments would be the same under Alternative D as under Alternatives B, C1, and C2, as discussed above.

As under Alternatives C1 and C2, the negligible decrease of 0.01 percent in energy use resulting from the Alternative D is not expected to have significant net impacts to TVA power supply requirements. Again, TVA notes that other factors affecting power supply requirements have much larger influence on TVA energy production. Because of the degree of uncertainty regarding customer response and the expected minor magnitude of any such response, TVA forecasters would not alter the demand or energy requirements forecast under Alternative D.

Similar to Alternatives C1 and C2, TVA does not expect the marginal slowing of investment in DER would result in any discernible increases in its operations or alter its generation and transmission systems. TVA does not anticipate any direct, indirect or cumulative impacts.

Table 9. Alternative D Price Elasticity Analysis and Potential Change To TVA Power Sales

ALTERNATIVE D ANALYSIS OF PRICE ELASTICITY	Standard Service		Large General Service	Large Manufacturing Service	Total kWh	% Change in kWh Sales
	Residential	Small C&I				
FY 2016 kWh Sales	63,147,047,691	54,504,212,007	4,220,782,935	33,653,180,522	155,525,223,155	
Wholesale Standard Service: The change would be revenue neutral to TVA. Elasticity analysis indicates no expected change in sales volume.	0	0	0	0	0	0.00%
Wholesale Non Standard Service: The change would be revenue neutral for TVA. Elasticity analysis indicates no expected change in sales volume.	0	0	0	0	0	0.00%
General Service Rates for Large Consumers: Decrease wholesale TOU Service energy rates under schedules General Service B, C, and D by \$23 million and to increase wholesale Standard Service rates and TOU manufacturing service rates approximately 0.3% to maintain TVA revenue neutrality. Elasticity analysis indicates a very small net decrease in kWh sales.	(20,131,096)	(18,288,230)	32,434,440	(7,326,356)	(13,311,243)	(0.01%)
Total Monthly Fuel Charge: Change the wholesale rate schedule fuel cost adjustment resource cost allocation methodology to isolate the cost allocation weighting for large customers served under a manufacturing service rate from large customers served under a general service rate. Elasticity analysis indicates a net change in kWh sales that approaches zero.	1,382,152	1,255,625	(1,220,496)	2,322,956	3,740,237	0.00%
Retail Rates: Change resale rates to reflect changes in wholesale power costs and to improve the alignment of retail charges with the new wholesale charges.	30,907,792	31,672,343	0	0	62,580,135	0.04%
Hydro Preference Allocation Rebalancing: No change to residential hydro allocation credits or residential sales volume is expected. Elasticity analysis indicates that the increase in the effective rates for non residential consumers will result in a 0.04% decrease in total sales volume.	0	(38,095,016)	(2,410,145)	(26,985,056)	(67,490,217)	(0.04%)
Total Expected Change in Sales Volume	12,158,848	(23,455,279)	28,803,799	(31,988,456)	(14,481,088)	(0.01%)

* The zero inserted for Wholesale Standard and Non Standard Service denotes that the changes at wholesale are unlikely to prompt or incent any changes by LPCs in their behavior.

3.5 Air Resources

3.5.1 Affected Environment

Air quality is an important environmental resource. Poor air quality can affect our health, ecosystem health, forest and crop productivity, economic development and our enjoyment of scenic views.

Through its passage of the Clean Air Act (CAA), Congress has mandated the protection and enhancement of our nation's air quality resources. National ambient air quality standards (NAAQS) for the following criteria pollutants have been set to protect the public health and welfare:

- Sulfur dioxide (SO₂)
- Ozone (O₃)
- Nitrogen dioxide (NO₂)
- Particulate matter whose particles are ≤ 10 micrometers
- Particulate matter whose particles are ≤ 2.5 micrometers (PM_{2.5})
- Carbon monoxide
- Lead

TVA coal-fired and natural gas fired electric generating facilities either directly emit these pollutants or contribute to their formation (O₃ and PM_{2.5}) in certain atmospheric conditions. Generally, TVA's hydro, nuclear, and renewable energy facilities do not directly contribute to air emissions. TVA has installed air emission controls at its fossil fueled facilities to reduce air emissions. For instance, TVA has installed selective catalytic reduction systems on 21 of its coal units and all of its natural gas fired combined cycle plants to reduce nitrogen oxide emissions, and has equipped 60 percent of its coal-fired capacity with scrubbers to address reduce sulfur-dioxide emissions. These emissions are expected to go down even further when coal-fired units at Allen are replaced with a combined cycle gas plant. Areas not meeting the standards are called "nonattainment" areas; there are no nonattainment areas designated within the TVA Power Service Area.

Hazardous Air Pollutants (HAPs) are toxic air pollutants, which are known or suspected to cause cancer or other serious health effects or adverse environmental conditions. The CAA identifies 187 pollutants as HAPs. Most HAPs are emitted by human activity, including motor vehicles, factories, refineries and power plants. Mercury is the HAP compound most associated with the burning of coal and power plant emissions. Other important issues concerning power plant emissions are acid deposition related to SO₂ and NO_x emissions, and visibility impairment, related in the TVA region mostly to ammonium sulfate particles formed from SO₂ emissions from coal-fired power plants. The most sensitive areas in the region are high elevation, forested areas such as the Great Smoky Mountains National Park. The nature of these pollutants, their effects and relationships to power production and industry are discussed more fully in TVA's 2015 IRP Supplemental EIS.

The primary greenhouse gas emission emitted by electric utilities is CO₂, produced by the combustion of coal, natural gas, and other fossil fuels. Under the IRP, TVA CO₂ emissions (measured by tons and by the emissions rate) resulting from the power generated by TVA and non-TVA facilities and marketed by TVA are anticipated to decline (see Figures 4-7 and 4-8 of TVA 2015).

The particular environmental attributes including emissions for the TVA generation fleet and totals for individual types of generating units (including natural gas-fired combustion turbines

and combined cycle turbines), are presented in Tables 7-1 and 7-2 of TVA's IRP Supplemental EIS (2015).

3.5.2 Environmental Consequences

Alternative A (No Action)

Under the No Action Alternative there would be no incremental effect from a rate change on air pollutant emissions and air quality of the region. As identified above, current trends in air quality would continue.

Alternative B (Reducing the Wholesale Standard Service Energy Rate by 0.25¢ per kWh and Adding Corresponding Grid Access Charges)

As discussed in the socioeconomic and energy use sections, implementing Alternative B is unlikely to result in any change to retail rates of customers. Thus, there would be no discernible change in energy use. The proposed rate change under Alternative B is relatively small and TVA projects that it is unlikely that most LPCs would pass on the grid access charge to customers. Because the change would not result in any alteration of TVA's generation operations, the current conditions and trends in air quality for the region, as discussed above, would continue.

Alternative C1 (Reducing the Wholesale Standard Service Energy Rate by 0.5¢ per kWh and Adding Corresponding Grid Access Charges)

As discussed above in the socioeconomic and energy use sections, the potential economic impacts and energy use changes under Alternative C1 are expected to be so small as to be indiscernible. Energy use changes, if any, would be so small that associated changes in ambient air pollution levels (air quality) would not be identifiable. Thus, as under Alternative B, the current conditions and trends in air quality for the region are generally expected to continue.

While an increased fixed cost may influence customers' investment in on-site energy (if LPCs elect to pass along the rate change to customers), any change in customer use of the energy source would be so small that any associated changes in TVA power generation and any resulting ambient air pollution or GHG levels would not be identifiable.

Alternative C2 (Reducing the Wholesale Standard Service Energy Rate by 1¢ per kWh and Adding Corresponding Grid Access Charges)

As under Alternative C1, the potential economic impacts and energy use changes under Alternative C2 are expected to be so small as to be indiscernible. Energy use changes, if any, would be so small that associated changes in ambient air pollution levels (air quality) would not be identifiable. Thus, the current conditions and trends in air quality for the region are generally expected to continue.

While an increased fixed cost may influence customers' investment in on-site energy (if LPCs elect to pass along the rate change to customers), any change in customer use of the energy source would be so small that any associated changes in TVA power generation and any resulting ambient air pollution or GHG levels would not be identifiable.

Alternative D (Reducing the Wholesale Standard Service Energy Rate by 2.5¢ per kWh and Adding Corresponding Grid Access Charges)

Under Alternative D, TVA would implement the greatest reduction in wholesale Standard Service energy rates and correspondingly grid access charge. Because the proposed reduction in energy rates and corresponding grid access charge under Alternative D are 2.5 to

5 times greater than under Alternatives C1 and C2, the proposed rate change would slow investment slightly more than under Alternatives C1 and C2. TVA does not foresee that the rate change would require TVA to change its operations or make modifications to its generation or transmission system. If any change to TVA operations were to result, it would likely be small and associated increases in ambient air pollution levels would not be identifiable. Thus, the current conditions and trends in air quality for the region are generally expected to continue.

As with Alternative C, the rate change may influence customers' investment in on-site energy sources but such effects would be so small that associated changes in TVA power generation (and resulting ambient air pollution or GHG levels) would not be identifiable.

3.6 Water Resources

3.6.1 Affected Environment

The quality of the region's water (surface water and groundwater) is critical to protection of human health and aquatic life. Major watersheds in the TVA region include the entire Tennessee River basin, most of the Cumberland River basin, and portions of the lower Ohio, lower Mississippi, Green, Pearl, Tombigbee, and Coosa River basins. As described in detail in TVA's 2015 IRP EIS, these water resources provide habitat for aquatic life, recreational opportunities, domestic and industrial water supplies, and other benefits. Wastewater discharges from cities or industries and runoff from nonpoint source activities such as construction, agriculture, mining, and air deposition can potentially degrade water quality.

Pollution involves the presence or introduction of a substance or thing into water resources that may harm the water resource and impact its beneficial uses, such as swimming or aquatic life. Every two years, states are required to submit a report to the U.S. Environmental Protection Agency (EPA) under Section 303(d) of the Clean Water Act. This report identifies the "impaired" lakes and streams that are not complying with water quality criteria and, consequently, are not suitable for their designated use. Thus, each state's 303(d) reports provide an updated overview of assessed water quality in each state.

Sources of degraded water quality include:

- Wastewater discharges from municipal sewage treatment systems, industrial facilities, concentrated animal feeding operations and other sources;
- Runoff discharge from agriculture, forest management activities, urban uses and mine lands, which transport sediment and other pollutants into streams and reservoirs. Runoff from commercial and industrial facilities and some construction sites is regulated through state National Pollutant Discharge Elimination System (NPDES) storm water permitting programs. The other sources not regulated through the NPDES program are referred to as "nonpoint source" runoff;
- Cooling systems such as those used by electrical generating plants and other industrial facilities to withdraw water from streams or reservoirs, use it to cool facility operations, and then discharge the heated water into streams and reservoirs. Impacts result from temperature changes, the trapping of organisms against intake screens or sucking them through the facility cooling system. These water intakes and discharges are controlled through state-issued NPDES permits; and
- Air pollution in the form of airborne pollutants such as mercury being spread through rainfall and deposition.

Additional regulatory protections for water quality and the mechanisms of how power generation can affect water quality and aquatic life are discussed in detail in the TVA (2011) and TVA (2015) EISs.

Groundwater refers to water located beneath the surface in rock formations known as aquifers. Eight major aquifers occur in the TVA region. Approximately half of the region has limited groundwater availability because of natural geo-hydrological conditions. More than 64 percent of the region's residents rely totally, or in part, on groundwater for drinking water. More than 1.7 million residents (22 percent) in the region maintain individual household groundwater systems, usually a well. All areas in the Tennessee Valley region can generally supply enough water for at least domestic needs. For the most part, the groundwater quality is adequate to support existing water supply uses even though some minimal treatment, such as filtration and chlorination, is sometimes required. Generating facilities involving combined-cycle combustion turbines often make use of groundwater for either cooling or reinjection of heated water.

3.6.2 Environmental Consequences

Impacts potentially occurring from rate changes are associated with changes in economic activity and those associated with changes in power demand. Increases in regional employment, income, or population can result in increased water demands, construction activities, and wastewater discharges. Likewise, increases in power demand can require additional generation and transmission facilities or longer operation of existing facilities.

Alternative A (No Action)

Under this alternative there would be no rate-related, incremental changes associated with operation of TVA generating facilities and consequently no addition or lessening of operational effects as identified in TVA's 2011 IRP or its 2015 update.

Alternative B (Reducing the Wholesale Standard Service Energy Rate by 0.25¢ per kWh and Adding Corresponding Grid Access Charges)

The potential economic and energy use changes for Alternative B are not expected to result in any change in energy use. The change would not result in any alteration of TVA's generation or transmission systems, and no changes of any kind are expected to energy use. Thus, no impacts to water resources would result from implementing Alternative B and the current condition of water quality for the region is generally expected to continue.

Alternative C1 (Reducing the Wholesale Standard Service Energy Rate by 0.5¢ per kWh and Adding Corresponding Grid Access Charges)

As noted above, negligible economic and energy use changes are expected under Alternative C1. TVA's analysis indicates that no changes or modifications would be necessary to TVA's operations or to TVA's generation or transmission systems. As with Alternative B, then, there would be essentially no or only extremely minor impacts to water resources from implementing this alternative. Thus, current water quality conditions for the region would generally be unaffected.

Alternative C2 (Reducing the Wholesale Standard Service Energy Rate by 1¢ per kWh and Adding Corresponding Grid Access Charges)

A greater energy rate reduction and grid access charge is proposed under Alternative C2 than Alternative B and C1. As noted above, negligible economic and energy use changes may be associated with Alternative C2. TVA's analysis indicates that such small changes would not necessitate changes to TVA's operations, modifications to TVA's generation or transmission systems; if changes are necessary, it is most likely that they would be very small. As with

Alternatives B and C1, there would be essentially no or only extremely minor impacts to water resources from implementing this alternative and current water quality conditions for the region would be unaffected.

Alternative D (Reducing the Wholesale Standard Service Energy Rate by 2.5¢ per kWh and Adding Corresponding Grid Access Charges)

Alternative D would result in the greatest reduction in wholesale Standard Service energy rates and correspondingly highest grid access charge. As noted above in the economic and energy use sections, Alternative D is expected to result in a very small change in energy use. Such a small change would not necessitate changes to TVA's operations or modification of its generation or transmission systems. Similar to Alternatives C1 and C2, there would be essentially no or only extremely minor impacts to water resources from implementing Alternative D and the current condition of water quality for the region is generally expected to continue.

3.7 Land Use

3.7.1 Affected Environment

TVA provides wholesale power to portions of a seven state region of 80,000 square miles. Major land uses in the TVA region include forestry, agriculture and urban/suburban/industrial development. Regional development is described in detail in TVA (2015). Of the non-federal land in the TVA region about 12 percent is considered developed and 88 percent as rural.

TVA's existing power plant reservations, excluding the hydroelectric plants associated with multi-purpose reservoirs, occupy about 25,000 acres. The actual disturbed acreage of these non-hydroelectric facilities is about 17,400 acres. Existing non-TVA generation facilities from which TVA purchases power under power purchase agreements utilize an area of approximately 2,400 acres.

3.7.2 Environmental Consequences

As stated in Section 3.1, different pricing structures for electricity may induce behavior that leads to creating, maintaining, or eliminating jobs and the development of new plants or facilities. Estimating potential changes to land use and development from rate change is a largely speculative undertaking because power rates are just one factor among many that influence decisions about land use and development.

Alternative A (No Action)

Under the No Action Alternative customers would continue to factor the current TVA rate structure into their decisions about siting of facilities and use of electricity. Since TVA would take no actions that might induce substantive increases in use of energy, there would be no need for additional generation facilities related to this rate change. Regional land use, trends and development in the TVA region would continue as identified in TVA's 2011 IRP and its 2015 update.

Alternative B (Reducing the Wholesale Standard Service Energy Rate by 0.25¢ per kWh and Adding Corresponding Grid Access Charges)

Under Alternative B, a minor change to power rates would be implemented. The potential for these changes to result in an appreciable change in energy use is highly unlikely; TVA projects that most LPCs would not pass along the rate change to customers. As noted above, Alternative B would not result in changes in energy use nor changes to TVA's operations or generation or transmission systems. Thus, the change would not influence the construction of new industrial or commercial facilities, the expansion of existing facilities, or the closing of

existing facilities; it would not require the construction of new generating or transmission facilities or even any discernible changes in how existing facilities are operated. Therefore, there would be no land use impacts from Alternative B.

Alternative C1 (Reducing the Wholesale Standard Service Energy Rate by 0.5¢ per kWh and Adding Corresponding Grid Access Charges)

Under Alternative C1, the change in energy use predicted is expected to be indiscernible. TVA would not be required to construct new generating facilities or expand or close existing facilities. Further, TVA does not forecast the need for construction or retirement of any transmission facilities or infrastructure. There would be no discernible changes in how existing TVA facilities are operated. The negligible change in energy use would be unlikely to spur or slow economic activity that would influence land use trends across the Valley, although the change could influence some individuals' and companies' decisions related to investment in self-generation and the associated use of their property. Decisions made by some individuals or companies to invest in self-generation is not anticipated to result in any change in land use trends across the Valley.

Alternative C2 (Reducing the Wholesale Standard Service Energy Rate by 1¢ per kWh and Adding Corresponding Grid Access Charges)

The potential impacts to land use trends under Alternative C2 are the same as Alternative C1. Under Alternative C2, the change in energy use predicted is expected to be negligible. Similar to Alternative C1, the negligible changes to energy use would not result in development or changes to land use by TVA and there would be no discernible changes in how existing TVA facilities are operated. The negligible change in energy use would be unlikely to spur or slow economic activity that would lead to land use trends across the Valley, although the change could influence some individuals' and companies' decisions related to investment in self-generation and the associated use of their property. Decisions made by some individuals or companies to invest in self-generation would not result in any change in land use trends across the Valley.

Alternative D (Reducing the Wholesale Standard Service Energy Rate by 2.5¢ per kWh and Adding Corresponding Grid Access Charges)

Under Alternative D, TVA would implement the greatest reduction in wholesale Standard Service energy rates and correspondingly highest grid access charge. The potential impacts to land use trends under Alternative D are generally the same as Alternatives C1 and C2. The alternative is likely to slow DER investment more so than Alternatives C1 or C2, which may influence the associated use of properties, but decisions to invest in self-generation would not result in any change in land use trends across the Valley.

3.8 Solid and Hazardous Waste Generation

3.8.1 Affected Environment

Residential, Commercial and Industrial Wastes

Residential and commercial wastes are usually generated in many, diffusely located areas and handled at municipal solid waste landfills. Most municipalities and counties currently engage in long-range planning processes to ensure that adequate capacity is provided for solid wastes generated within their jurisdictions. Solid waste reduction and recycling is an important emphasis in most of these plans. For example, in the state of Tennessee, in 2014 Tennessee businesses, industries, citizens and others disposed of 11,66,791 tons of solid waste, which equated to 5.15 pounds of waste per person per day. Of this amount 6,142,247 tons went to Class 1 landfills and 5,524,544 tons were recycled, reused or diverted to other facilities. Using 1995 as the base year, per capita waste reduction and diversion rate for 2014

was 30.0 percent, compared with 22.6 percent in 2000 (TDEC 2015).

Tennessee, as well as other states in the Valley, has also implemented a program for collection and safe storage and disposal of household hazardous waste (HHW). The program collects and properly disposes of paint, flammable liquids, corrosives, oxidizers, batteries, and pesticides. Ninety-four counties in Tennessee have participated in the mobile collection service since it began in 1993 and an average event yielded 4,592 pounds of HHW (with a 0.6 percent participation rate). (TDEC 2015)

Industrial solid and hazardous waste generation and handling is similar. Current legislative and regulatory programs encourage and/or mandate the reduction, recycling, and proper disposal of industrial solid and hazardous wastes. The states within the TVA power service area have state-administered, Resource Conservation and Recovery Act (RCRA) equivalent programs, which emphasize waste reduction, recycling, and proper handling and disposal of solid and hazardous wastes. Industries benefit both financially and from a public relations standpoint by engaging in waste reduction and recycling opportunities in the same way that TVA benefits from its marketing and utilization of coal combustion residuals (CCR) that are a by-product of coal-based generation. It is, therefore, likely that industrial solid and hazardous waste generation and disposal will continue to decline in the future.

TVA-Generated Wastes

Types of wastes typically produced by construction activities whether by TVA or others include vegetation, demolition debris, oily debris, packing materials, scrap lumber, and domestic wastes or garbage. Non-hazardous wastes (excluding CCR) typically produced by common operation of TVA facilities include sludge and demineralizers from water treatment plant operations, personal protective equipment, oils and lubricants, spent resins, desiccants, batteries and domestic waste. Between 2010 and 2013, TVA facilities produced approximately 21,000 tons of solid waste per year.

TVA facilities include large, small, and very small quantity generators (previously conditionally exempt generators) of hazardous waste. Hazardous non-radiological wastes typically produced by common TVA facility operations include paint and paint solvents, paint thinners, discarded out-of-date chemicals, parts washer liquids, sand blast grit, chemical waste from cleaning operations and broken fluorescent bulbs. Routine operations between 2010 and 2013 annually created about 35,537 kilograms of hazardous waste annually and 39,710 kilograms of Toxic Substances Control Act (TSCA) and universal wastes. TVA's hazardous wastes and those requiring special handling (TSCA and universal waste) are generally shipped to Waste Management's Emelle, Alabama facility for disposal. TVA reduction programs for hazardous waste, based upon source reduction, have been in place on the TVA system for some time.

Coal combustion solid wastes or residues (i.e. CCR) include fly ash, bottom ash, boiler slag, char spent bed material and sludge from operation of wet flue gas desulfurization systems. In the past, the EPA has determined that CCRs are not hazardous and in April 2015 decided to continue to regulate them as nonhazardous, solid waste. In 2015, TVA produced approximately 3.9 million tons of CCRs of which 33.6 percent was utilized or marketed (TVA 2016). Annually CCR production at TVA's coal-fired plants fluctuates due to a variety of factors including primarily: plant planned and forced maintenance outages, load swings, plant dispatch (the process by which plants are directed to increase or decrease power generation based on the cost of production at each plant—generally the larger, more efficient units run more and the smaller, less efficient units run less), and variation in fuel supplies (BTU, sulfur, and ash content of the fuels burned). Additionally, recent decisions to retire coal-fired generation further reduce the amount of CCRs generated by TVA at its plants. The amount of

CCRs that are disposed also is reduced through marketing and utilization of these by-products in a number of commercial applications including use of fly ash in concrete products, bottom ash as aggregate in cement block manufacturing, boiler slag for roofing granules and industrial abrasives, and scrubber gypsum in gypsum wallboard and cement manufacturing.

3.8.2 Environmental Consequences

Alternative A (No Action)

Current trends in waste production and reduction as identified in the example for Tennessee above and in TVA (2011) and TVA (2015) would continue for TVA in the region.

Alternative B (Reducing the Wholesale Standard Service Energy Rate by 0.25¢ per kWh and Adding Corresponding Grid Access Charges)

Under Alternative B, a minor change to power rates would be implemented. As noted above, no changes to energy use and no changes to TVA operations or its systems would result. Because TVA does not project any change to energy use, no additional waste generation, by TVA or others, would result from the implementation of Alternative B.

Alternative C1 (Reducing the Wholesale Standard Service Energy Rate by 0.5¢ per kWh and Adding Corresponding Grid Access Charges)

Under Alternative C1, the change in energy use predicted is expected to be indiscernible from current use. Any energy use changes would be so small that any associated increases in waste generation would not be identifiable. The rate change would not result in discernible changes in residential, commercial or industrial waste generation either; the rate change would be unlikely to spur or slow economic activity in the TVA service area that may affect the generation of waste.

Alternative C2 (Reducing the Wholesale Standard Service Energy Rate by 1¢ per kWh and Adding Corresponding Grid Access Charges)

Like Alternative C1, the change in energy use predicted is expected to be indiscernible under Alternative C2. Any energy use changes would be so small that any associated increases in waste generation would not be identifiable. The rate change would not result in discernible changes in residential, commercial or industrial waste generation as well; the rate change would be unlikely to spur or slow economic activity in the TVA service area that may affect the generation of waste.

Alternative D (Reducing the Wholesale Standard Service Energy Rate by 2.5¢ per kWh and Adding Corresponding Grid Access Charges)

Under Alternative D, TVA would implement the greatest reduction in wholesale Standard Service energy rates and correspondingly highest grid access charge. However, like Alternatives C1 and C2, the change in energy use predicted is expected to be so small that any associated increases or decreases in waste generation would not be identifiable. No discernible change to the residential, commercial or industrial waste generation is anticipated.

3.9 Summary of TVA Commitments and Proposed Mitigation Measures

Due to the minor and insignificant impacts identified for the action alternatives, there are no TVA commitments or proposed mitigation measures identified for implementation of this action.

3.10 Cumulative Impacts

The nature of conducting analyses of proposed rate changes complicates the review of potential cumulative impacts of such actions. By following the analytical framework presented in section 3.1, some estimations may be made regarding the potential that such actions may result in cumulative impacts.

Cumulative impacts are addressed in the socioeconomics section above. As noted therein, economic impacts could be experienced by consumers if TVA implements additional rate changes in the future to recover greater portions of its fixed costs. Should TVA implement additional rate changes in the future, the cumulative impacts of those changes may resemble the impacts analyzed in the review of Alternative D, which would implement a much greater fixed cost recovery than other alternatives and result in the greatest grid access charge and corresponding energy rate decrease.

In addition, TVA periodically adjusts its rates across the board to match revenue needs. Such rate adjustments are not intended to be revenue neutral. Rate adjustments would typically increase the monthly electricity bills of customers. The most recent adjustment was implemented by TVA in October 2017; the 1.5% increase was below the rate of inflation. Cumulatively, such adjustments would have either beneficial or adverse economic effects on all customers depending on whether the proposed rate adjustment increases or decreases the power rates.

As noted above, TVA found very minor economic effects associated with implementation of Alternative D and found that there would be no or indiscernible environmental impacts. Potential future rate changes to recover fixed costs would most likely be minor and implemented gradually, when compared to Alternative D, thereby further minimizing the potential for effects. Generally, when a proposed action does not result in direct or indirect effects on a resource, there would be no cumulative impacts to that resource. In its analysis, TVA found there would be no direct environmental impacts and that there would be indiscernible or no indirect environmental impacts associated with the rate change alternatives. Therefore, no cumulative impacts or only marginal cumulative impacts associated with the rate change alternatives are predicted.

TVA has identified numerous other related activities that may cumulatively affect resources of concern. Among the other activities conducted by TVA with potential to influence consumer behavior and investment in DER are the Green Power Providers (discussed above) and Green Power Switch programs, TVA economic development efforts, and TVA energy efficiency programs for residences, businesses, and industries (e.g., EnergyRight Solutions). These activities, past and ongoing, are unlikely to influence the rate of adoption of DER across the Tennessee Valley.

Other Federal programs and policies may influence energy use in the Tennessee Valley as well as the rate of investment in DER by private consumers. These include tax credits or deductions for renewable energy initiatives, trade tariffs applied to DER components, and programs by other Federal agencies (e.g., Department of Energy) addressing DER. While these Federal programs and policies influence the rate of adoption of DER, the fate of these programs and policies remain uncertain at this time. In addition, many LPCs may conduct related activities that influence customer behavior, investments in DER, and energy efficiency. TVA utilizes its Integrated Resource Planning process to consider the cumulative market and social forces that these programs, as well as other relevant inputs, have on TVA's energy generation and to provide direction on how to best meet future electricity demand. The 2015

IRP provides an important discussion regarding past, present, and foreseeable activities that influence energy use, and the EIS that accompanied it describes cumulative impacts from combining different scenarios and strategies (see Chapter 7 of the IRP EIS). The impacts associated with the alternatives analyzed in this EA are bounded by analyses in TVA's IRP.

3.11 Recipients

TVA will make the final EA available to the public and those that participated in the review process by posting the document on the TVA webpage (www.tva.gov/nepa). A notice of the availability of the EA will be sent to local power companies, the TVPPA, the TVIC, and the State of Tennessee Department of Environment and Conservation.

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2018 Rate Change

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2018 Rate Change

**Appendix A: TVA Rate Change Letter to Local Power
Companies (August 9, 2017)**

2018 Rate Change



Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

August 9, 2017

Dear Local Power Company:

Since the fall of 2013, TVA, local power companies (LPCs), and their customers have worked collaboratively to develop and implement a Strategic Pricing Plan (SPP) which focuses on TVA's long-term pricing efforts. The SPP provides a long-term direction in three areas: improved pricing, fixed-cost recovery, and encouraging economic technology investments. The rate change implemented in 2015 focused primarily on improving pricing by better aligning rates with underlying cost drivers. The 2018 rate change will maintain this focus. Accordingly, TVA is proposing changes to the Schedule of Rates and Charges attached to and made a part of our Power Contract.

TVA and the Tennessee Valley Public Power Association's Rates and Contracts Committee (TVPPA) have discussed changes to wholesale and resale rates since the fall of 2016. The enclosure to this letter describes TVA's rate change proposal. In accordance with the provisions of the section entitled "Adjustment and Change of Wholesale Rate and Resale Rates" of the Schedule of Terms and Conditions of the Power Contract, and consistent with our collaboration with you, we believe revenue-neutral structural changes are warranted to the Schedule of Rates and Charges. TVA is requesting that you or your representative continue to meet with us and endeavor to reach agreement with respect to the proposed changes.

We understand that TVPPA will be serving as the representative for most LPCs. If that is not the case for your system, please contact your TVA Customer Service Manager.

The proposed changes described in the enclosure do not reflect any rate adjustments that may take place between today and the implementation date of the rate change. The proposed rate change is not intended to raise additional revenue for TVA. However, individual systems and their customers may see some effects on their bills, and we will assist you in analyzing, understanding, and planning for these changes in the coming months.

We look forward to discussing this proposal with you. If you have any questions or need any additional information, please contact your TVA Customer Service Manager.

Sincerely,

A handwritten signature in black ink, appearing to read "Cass Larson".

Cass Larson
Vice President
Pricing & Contracts

A handwritten signature in black ink, appearing to read "Daniel P. Pratt".

Daniel P. Pratt
Vice President
Customer Delivery

2018 Rate Change

TVA RATE CHANGE PROPOSAL

TVA has worked since the fall of 2016 with the Tennessee Valley Public Power Association's Rates and Contracts Committee (TVPPA) and is proposing the rate change and related matters set forth below:

I. Wholesale Rates

The currently available wholesale rate schedule (Schedule WS) would be replaced by a changed wholesale rate schedule that would be more particularly developed in conjunction with Local Power Companies (LPCs) over the next 180 days. Generally, the proposed wholesale rate changes include, but are not limited to, the following:

1. Reducing seasonal wholesale standard service energy charges by \$1.2 billion per year (which is approximately 1 cent per kWh) and introducing a new wholesale fixed-cost recovery charge that would recover an equivalent amount of revenue. TVPPA has suggested modifying this proposal by reducing standard service energy charges by a lower amount, such as \$300 million per year (which is approximately 0.25 cent per kWh). Currently, the proposed design for a new wholesale fixed-cost recovery charge is a fixed-cost recovery charge that would be allocated to each LPC based on its percentage contribution to the total TVA standard service energy usage during a historical baseline period and reset on an agreed upon schedule (such as a 5-year baseline with a rolling reset)

Alternative allocation methodologies would also be considered. Examples of such alternatives have included allocations based on cost-of-service or a contract demand requirement. Under any alternative, all such new wholesale fixed-cost recovery charges would be subject to TVA rate adjustments.

2. Changing TOU Service rates applicable to Large Customers (as defined in the wholesale power rate schedule) and all corresponding retail rates to reflect new fixed-cost recovery charges designed (a) to recover a percentage of TVA total revenue from all Large Customers and (b) to convert volumetric energy rates into a contract demand charge. The wholesale power rate schedule and all corresponding retail rate schedules would be re-issued and their underlying rates would be modified to appropriately reflect the new fixed-cost recovery charges.

3. Moving specifically stated hydro allocation wholesale rate schedule adjustment 2 charges (debits and credits) from the wholesale rate schedule to the Adjustment Addendum. The changed adjustment 2 would instead provide that LPCs' power bills are subject to the hydro allocation adjustments in the current Adjustment Addendum published by TVA to reflect the value of the hydro generation benefits allocated by TVA to residential customers. The hydro allocation adjustments would continue to be subject to the same yearly re-computation and adjustment schedule, and LPCs would also continue to report required hydro allocation data to TVA on a monthly schedule.

2018 Rate Change

4. Moving the embedded hydro allocation wholesale rate schedule adjustment 4 charges from the TOU Service demand and energy charges to the Adjustment Addendum. The currently effective wholesale schedule adjustment 4 recognizes that the TOU Service demand and energy charges contain embedded debit components which, together with the wholesale rate schedule adjustment 2, are designed to reflect the value of the hydro generation benefits allocated by TVA to residential customers. The changed adjustment 4 would provide that TOU Service demand and energy charges would be increased or decreased to appropriately reflect the value of the hydro generation benefits allocated by TVA to residential customers in accordance with the hydro allocation adjustments in the current Adjustment Addendum published by TVA. The adjustment 4 hydro allocation adjustments would continue to be subject to adjustment by TVA from time to time.
5. Changing the hydro allocation debit and credit methodology. TVA and TVPPA will analyze alternative hydro debit and credit structures and credit levels with special attention focused on residential customer impacts. Any changes would be revenue-neutral relative to the currently designated value of the hydro generation benefit and implemented via the Adjustment Addendum.
6. Decreasing wholesale TOU Service demand and energy rates under general power rate schedules GSB, GSC, and GSD. In order to maintain revenue neutrality, wholesale Standard Service rates and/or TOU Service manufacturing power rates would be increased. Changes proposed under this section would be guided by cost of service and commercial competitiveness study data.
7. Transitioning all non-fuel wholesale adjustment addendum amounts, including the environmental adjustment, that are applicable prior to the effective date of the Rate Change, into the wholesale base charges. This section would be applied only to the extent it is administratively practical.
8. Eliminating or phasing-out, by October 2018, the availability of wholesale mid-month billing arrangements. Such wholesale mid-month billing arrangements are currently implemented through a rider to the wholesale power rate schedule. Under this proposal, the availability of those riders would be eliminated or phased-out.
9. Changing the wholesale rate schedule adjustment 1 fuel cost adjustment resource cost allocation methodology to isolate the cost allocation weighting for Large Customers served under a manufacturing service rate from Large Customers not served under a manufacturing service rate. This change would be expected to have the effect of lowering these manufacturing customers' fuel cost adjustment amounts.

II. Resale Rates

To enable LPCs to continue operating on a financially sound basis after the wholesale rate change, TVA would make the following changes to the resale rate schedules:

1. Change resale rates to reflect changes in wholesale power costs.

2018 Rate Change

2. Improve the alignment of new wholesale charges with retail, provided, however, that any such change for Large Customers at retail would occur concurrently with wholesale changes made under section I.2 above.
3. Transition hydro allocation adjustments from the rate schedule base charges to the Adjustment Addendum.
4. Transfer all non-fuel Adjustment Addendum amounts, including the environmental adjustment, that are applicable prior to the effective date of the Rate Change, into the rate schedule base charges. This section would be applied only to the extent it is administratively practical.
5. For service to customers for which the LPC is billed under Standard Service charges, increase the power cost recovery component of resale rates to account for anticipated bill impacts resulting from changed Standard Service wholesale rates.

III. Other matters to be discussed in conjunction with the Rate Change

TVA proposes to explore with LPCs additional opportunities to simplify rate schedule language and improve processes for approving and publishing rates and rate-related documents. Proposed improvements include, but are not limited to, the following:

1. ESS Reporting. Revise the current ESS reporting requirements to remove outdated references and reflect the intent of reporting requirements in a more general manner.
2. Outdoor Lighting Rate Schedule. Revise Part B of the current Outdoor Lighting Schedule in order to replace current listing of available fixtures to a cost-based formula.
3. B, C, and D Rate Schedule Unification. Combine General Service B, C, and D rates into one rate schedule and combine Manufacturing B, C, and D rates into one rate schedule.

Hydro Allocation Re-balancing. The monetary amounts used in determining the Hydro Allocation Adjustment (debits and credits) would be recomputed to take account of changed sales and customer account data and applied to wholesale and retail rates accordingly.

2018 Rate Change

Appendix B: Average Price of Electricity to Ultimate Customers by End-Use Sector, by State

2018 Rate Change

Table B-1. Average Price of Electricity to Ultimate Customers by End-Use Sector, by State, Year-to-Date Through July 2017 and 2016 (Cents per kilowatt-hour)

	Residential		Commercial		Industrial		Transportation		All Sectors	
Census Division and State	July 2017 YTD	July 2016 YTD	July 2017 YTD	July 2016 YTD	July 2017 YTD	July 2016 YTD	July 2017 YTD	July 2016 YTD	July 2017 YTD	July 2016 YTD
<i>New England</i>	19.28	19.03	15.19	15.16	12.38	12.07	8.42	8.49	16.41	16.21
Connecticut	20.10	20.61	15.99	15.82	13.26	13.10	10.79	10.98	17.50	17.58
Maine	16.03	15.57	12.28	12.08	9.29	8.90	--	--	13.17	12.71
Massachusetts	19.96	19.29	15.43	15.51	13.46	13.06	6.38	6.43	16.82	16.53
New Hampshire	19.01	18.29	14.63	14.40	12.26	12.32	--	--	16.04	15.61
Rhode Island	18.13	18.40	15.10	15.05	14.30	13.60	19.47	18.55	16.27	16.27
Vermont	17.60	17.21	14.61	14.49	10.14	10.07	--	--	14.59	14.37
<i>Middle Atlantic</i>	15.99	15.63	12.56	12.42	6.93	7.02	11.22	10.86	12.66	12.51
New Jersey	15.88	15.74	12.54	12.46	10.26	10.23	9.03	8.75	13.58	13.50
New York	17.92	17.32	14.60	14.17	5.87	5.94	12.57	11.97	14.67	14.22
Pennsylvania	14.26	14.03	9.04	9.35	6.80	6.93	7.28	7.73	10.21	10.29
<i>East North Central</i>	13.20	12.86	10.10	9.78	7.04	6.84	6.81	6.93	10.09	9.83
Illinois	12.62	12.25	8.94	8.71	6.44	6.33	6.49	6.71	9.36	9.15
Indiana	11.92	11.13	10.28	9.54	7.40	6.81	11.41	9.50	9.59	8.89
Michigan	15.55	15.05	11.07	10.53	7.38	6.92	12.10	11.51	11.47	10.96
Ohio	12.31	12.38	9.94	9.81	6.65	6.81	7.56	7.67	9.68	9.76
Wisconsin	14.63	14.40	11.11	11.02	7.81	7.74	14.30	14.42	11.07	10.97
<i>West North Central</i>	12.02	11.62	9.81	9.44	7.29	7.05	8.85	9.07	9.85	9.53
Iowa	12.49	12.16	9.57	9.31	6.18	6.08	--	--	8.87	8.72
Kansas	13.25	12.98	10.47	10.33	7.54	7.47	--	--	10.58	10.47
Minnesota	13.10	12.55	10.63	9.74	7.74	7.22	9.47	10.03	10.55	9.92

2018 Rate Change

	Residential		Commercial		Industrial		Transportation		All Sectors	
Census Division and State	July 2017 YTD	July 2016 YTD	July 2017 YTD	July 2016 YTD	July 2017 YTD	July 2016 YTD	July 2017 YTD	July 2016 YTD	July 2017 YTD	July 2016 YTD
Missouri	11.37	10.83	9.38	9.06	7.06	6.73	8.21	7.98	9.92	9.49
Nebraska	10.79	10.70	8.99	8.87	7.66	7.82	--	--	9.12	9.12
North Dakota	10.25	10.04	9.18	9.04	8.63	8.11	--	--	9.23	8.93
South Dakota	11.46	11.24	9.53	9.39	7.74	7.55	--	--	9.88	9.71
<i>South Atlantic</i>	<i>11.93</i>	<i>11.61</i>	<i>9.44</i>	<i>9.31</i>	<i>6.45</i>	<i>6.35</i>	<i>7.96</i>	<i>7.87</i>	<i>10.00</i>	<i>9.82</i>
Delaware	13.42	13.42	10.11	10.19	7.83	8.06	--	--	11.09	11.18
District of Columbia	12.73	12.96	11.73	11.71	8.41	9.08	9.44	9.36	11.83	11.86
Florida	11.75	11.17	9.55	9.12	7.91	7.72	8.47	8.30	10.56	10.09
Georgia	11.85	11.40	9.98	9.66	5.82	5.56	5.26	4.91	9.75	9.43
Maryland	14.16	14.26	10.89	10.97	8.44	7.88	7.87	7.80	12.16	12.24
North Carolina	11.06	11.11	8.52	8.65	6.09	6.16	8.70	7.85	9.11	9.23
South Carolina	12.80	12.39	10.46	10.11	6.05	5.94	--	--	9.79	9.59
Virginia	11.54	11.45	7.88	8.13	6.58	6.72	7.77	7.89	9.14	9.26
West Virginia	11.61	10.99	9.62	9.29	6.71	6.54	--	--	9.07	8.82
<i>East South Central</i>	<i>11.27</i>	<i>10.66</i>	<i>10.55</i>	<i>9.99</i>	<i>5.98</i>	<i>5.68</i>	<i>--</i>	<i>--</i>	<i>9.30</i>	<i>8.88</i>
Alabama	12.64	11.88	11.61	11.01	6.20	5.92	--	--	9.87	9.42
Kentucky	10.57	10.11	9.64	9.33	5.60	5.39	--	--	8.41	8.15
Mississippi	11.27	10.57	10.31	9.57	6.14	5.76	--	--	9.19	8.64
Tennessee	10.68	10.10	10.45	9.84	6.01	5.62	--	--	9.53	9.05
<i>West South Central</i>	<i>10.76</i>	<i>10.50</i>	<i>8.36</i>	<i>7.79</i>	<i>5.47</i>	<i>5.09</i>	<i>8.03</i>	<i>5.64</i>	<i>8.31</i>	<i>7.97</i>
Arkansas	10.15	9.76	8.42	8.11	5.87	5.79	11.82	9.26	8.12	7.94
Louisiana	9.47	8.92	8.93	8.40	5.36	4.81	10.04	8.93	7.69	7.19
Oklahoma	10.46	9.86	7.96	7.26	5.29	4.71	--	--	8.11	7.53

2018 Rate Change

Census Division and State	Residential		Commercial		Industrial		Transportation		All Sectors	
	July 2017 YTD	July 2016 YTD	July 2017 YTD	July 2016 YTD	July 2017 YTD	July 2016 YTD	July 2017 YTD	July 2016 YTD	July 2017 YTD	July 2016 YTD
Texas	11.14	11.04	8.31	7.73	5.47	5.14	7.87	5.41	8.50	8.23
<i>Mountain</i>	<i>11.84</i>	<i>11.61</i>	<i>9.66</i>	<i>9.50</i>	<i>6.46</i>	<i>6.24</i>	<i>9.91</i>	<i>9.53</i>	<i>9.50</i>	<i>9.25</i>
Arizona	12.36	12.21	10.61	10.49	6.41	5.86	9.30	9.08	10.65	10.34
Colorado	12.08	11.79	9.84	9.42	7.27	6.96	10.02	9.40	9.89	9.57
Idaho	10.02	9.97	8.01	7.80	6.75	6.65	--	--	8.28	8.12
Montana	10.99	10.95	10.18	10.15	5.03	4.94	--	--	8.97	8.86
Nevada	11.83	11.53	7.84	8.08	5.82	5.69	8.21	7.80	8.57	8.36
New Mexico	12.91	11.73	10.32	9.64	6.08	5.74	--	--	9.71	9.00
Utah	11.12	11.05	8.81	8.81	6.21	6.37	10.09	9.98	8.72	8.76
Wyoming	11.29	11.07	9.74	9.41	6.96	6.91	--	--	8.32	8.18
<i>Pacific Contiguous</i>	<i>14.87</i>	<i>14.35</i>	<i>13.38</i>	<i>12.95</i>	<i>9.11</i>	<i>8.88</i>	<i>8.30</i>	<i>8.75</i>	<i>13.02</i>	<i>12.55</i>
California	18.24	17.28	15.36	14.74	12.22	11.76	8.27	8.73	15.77	15.01
Oregon	10.66	10.51	8.87	8.82	6.13	6.09	9.30	9.24	8.95	8.83
Washington	9.47	9.32	8.44	8.36	4.60	4.48	9.02	9.01	7.87	7.67
<i>Pacific Noncontiguous</i>	<i>25.79</i>	<i>24.21</i>	<i>23.26</i>	<i>21.27</i>	<i>20.99</i>	<i>18.88</i>	--	--	<i>23.29</i>	<i>21.35</i>
Alaska	21.41	20.41	19.69	18.09	16.87	15.34	--	--	19.65	18.24
Hawaii	29.39	27.22	26.52	24.12	22.58	20.18	--	--	25.78	23.41
<i>U.S. Total</i>	<i>12.86</i>	<i>12.47</i>	<i>10.60</i>	<i>10.30</i>	<i>6.85</i>	<i>6.65</i>	<i>9.67</i>	<i>9.45</i>	<i>10.48</i>	<i>10.19</i>

Source: U.S. Energy Information Administration, Form EIA-861M (formerly EIA-826), Monthly Electric Power Industry Report.

Displayed values of zero may represent small values that round to zero. Utilities and energy service providers may classify commercial and industrial customers based on either NAICS codes or demands or usage falling within specified limits by rate schedule. Changes from year to year in consumer counts, sales and revenues, particularly involving the commercial and industrial consumer sectors, may result from respondent implementation of changes in the definitions of consumers, and reclassifications. Totals may not equal sum of components because of independent rounding.

2018 Rate Change

Appendix C: TVA Cost of Service Fiscal Year 2016: A Summary of Wholesale Cost of Service Methodologies and Results

2018 Rate Change

The logo for the Tennessee Valley Authority (TVA) is displayed. It features the words "Tennessee Valley Authority" in a white, sans-serif font, centered within a blue rectangular background. Below the blue rectangle is a thin, horizontal grey bar.

Cost of Service Fiscal Year 2016

A Summary of Wholesale Cost of Service Methodologies and Results

May 2017

2018 Rate Change

Cost of Service

1.1 OVERVIEW

Cost of service is a detailed analysis of financial and operational data that culminates in the assignment of system level costs to rate classes and to customers within rate classes. Each year as part of the cost of service study, revenue to cost relationships are analyzed to determine how well the rates and the rate design structures are working. Ideally, the revenue received from each rate class or customer equals the costs incurred to serve that rate class or customer.

There are almost an infinite number of ways to do an embedded cost of service study, but all include three basic steps: functionalization, classification, and allocation. Costs are **functionalized** by specific utility function (i.e., generation, transmission, distribution, customer, etc.). Generation costs are further **classified** based on whether they are capacity (also referred to as fixed generation or demand) costs or energy (also referred to as variable generation) costs. In the final step, the functionalized and classified costs are **allocated** to rate classes and to customers within rate classes.

Both functionalization and classification are primarily based upon account number under the Federal Energy Regulatory Commission's (FERC) Uniform System of Accounts for Electric Utilities. Allocation to rate classes and to customers within rate classes is done in a manner reflective of cost causation. The allocation to each rate class or customer is based on the portion of each cost category deemed to have been incurred to serve that rate class or customer.

2.1 BACKGROUND

From 1992 to 2011, TVA sold power to local power companies (LPCs) under an End-Use Wholesale structure. Each LPC's wholesale power cost was dependent upon the classification of the retail customers to whom the power was resold. The End-Use Wholesale rate structure did not reflect the variation in production costs by time of day and by season nor did it encourage LPCs or their customers to manage peak demands or energy consumption. While the End-Use Wholesale rate structure was in effect, the cost of service study was based on precise load data for the LPCs and most of the larger customers but on decades-old load profiles for the LPC-served residential, commercial, and industrial end-use segments.

In April 2011, TVA implemented its first major rate change in nearly two decades. The End-Use Wholesale structure was replaced with a Seasonal Demand and Energy rate structure similar to those commonly used by other electric utilities. The cost of service studies for subsequent fiscal years have been based on metered load data due to the availability of metered load data for not only the LPCs and directly served customers, but also for the large LPC-served customers with power contract demands in excess of 5 MW.

3.1 DEFINITION OF RATE CLASSES FOR EVALUATION

There are three major rate classes with common service attributes over which the fiscal year 2016 cost of service study is evaluated: standard service, large general service, and large manufacturing service. Standard service (SS) comprises the LPCs' power sales to residential, small commercial, and small manufacturing customers. Large general service (LGS), also known as large commercial service, is service to non-manufacturing customers with power contract demands greater than 5 MW. Large manufacturing service (LMS), also known as large industrial service, is service to manufacturing consumers with power contract demands greater than 5 MW. LGS and LMS may be provided to a customer directly by TVA or by an LPC. LGS and LMS customers are subject to the same rate structure regardless of whether the service is provided by TVA or an LPC. TVA provides service directly to 52 LGS and LMS customers. The LPCs provide service

to approximately 400 LGS and LMS customers.

4.1 GUIDING PRINCIPLES

In preparation for the 2011 rate change, TVPPA and TVA adopted guiding principles to lead the collaborative process. These guiding principles, as amended, continue to inform the 2018 rate change.

1. **Rates must recover all costs.** Both TVA and LPCs need to recover their total costs to provide service in order to remain financially sound.
2. **Rates must track cost of service.** Rates that do not accurately track cost of service create unsustainable subsidies among customers and among customer classes. The objective of this principle is to create awareness that rates must track cost of service to ensure an overall lower cost of electric service across the Valley.
3. **Rates must send pricing signals.** The cost to provide electric service comprises two broad categories of costs: variable and fixed. Variable costs are primarily fuel and purchased power costs and vary by hour of day, by day of week, and by season of year. Fixed costs include operations and maintenance costs, interest expense, and depreciation and are relatively constant throughout the year. Pricing signals are useful in communicating the inherent differences in variable and fixed costs and provide customers incentives to plan accordingly.
4. **Rates must balance precision with simplicity.** Rates and rate design cannot be so complex that they create confusion or administrative and communication issues.
5. **Rates must be stable.** We need rates and rate design which create a stable environment for customers.
6. **Rates must be competitive.** TVA has set a goal of having effective rates in the top quartile with an initial focus on maintaining competitive industrial rates.

5.1 %FUNCTIONALIZATION and CLASSIFICATION

TVA uses the FERC Uniform System of Accounts for Electric Utilities. Table 1 on the following page lists the cost categories used by TVA for cost of service functionalization and classification and provides the specific FERC account numbers, their descriptions, and the amounts and percentages of total costs as categorized for fiscal year 2016. TVA, TVPPA, and TVIC agree generally on the functionalization and classification of fiscal year 2016 costs.

Costs fall into two broad categories: fixed and variable. Fixed costs do not vary in relation to generation or sales. Variable costs vary directly in relation to generation or sales.

Generation costs are classified as either capacity or energy. Capacity costs are costs incurred to generate electricity that do not vary with generation, and are considered fixed. Energy costs are costs incurred to generate electricity that vary with generation and are considered variable.

Transmission costs are the costs associated with the transmission of power through the TVA system, from the generation source or interchange point to customer delivery points. Transmission costs are considered fixed.

Other costs are costs not associated with generation or transmission. Other costs include amortization of regulatory assets, customer service expenses, and payments in lieu of taxes. Other costs are generally fixed.

6.1 Table 1

Functions and Classes	FERC Account Numbers Included	2016	
		\$ millions	%
Capacity	500 through 554.1 Power Production Expenses (excluding 501, 518, 547, and energy-related portion of 555) Allocations of 427 through 432 Interest Charges Allocations of 403 Depreciation Expense Allocations of 920 through 935 Administrative and General Expenses	\$4,292	40%
Energy	501 Fuel 518 Nuclear Fuel Expense 547 Fuel 555 Purchased Power	\$3,001	28%
Transmission and Ancillary	556 through 557 Other Power Supply Expense 560 through 574 Transmission Expenses Allocations of 427 through 432 Interest Charges Allocations of 403 Depreciation Expense Allocations of 920 through 935 Administrative and General	\$871	8%
Other	407.3 Regulatory Debits (amortization) 411.1 Accretion (not the FERC name) 901 through 917 Customer and Sales Expenses Allocations of 427 through 432 Interest Charges Allocations of 920 through 935 Administrative and General	\$2,113	19%
Taxes	408.1 Taxes Other Than Income Taxes	\$522	5%
Total Costs		\$10,799	100%

ALLOCATION

There are four categories of costs to be allocated in the cost of service for TVA: capacity, energy, transmission, and other. While there is general consensus among TVA, TVPPA, and TVIC regarding the functionalization and the classification of TVA system costs, there is considerable disparity in their respective approaches to the allocation of those costs to rate classes and to customers within rate classes.

7.1 Capacity

Capacity costs allocators generally assign costs based on the rate class or customer contribution to system peak. Common variations include consideration of the annual system peak (1 CP), a weighting of peaks from summer and winter (2SW CP), the average of the twelve monthly coincident peaks (12 CP), multiple coincident peaks within 5 to 10% of the system peak (Top 50, Top 200), and all hours (in essence an average energy allocator).

TVA's position is that capacity costs are incurred to serve load that is consistently coincident with system peak

and has used the Top 200 system peaks as an approximation of all peaks within 10% of the annual system peak. At the suggestion of TVIC, TVA has fine-tuned this allocator to the Top 200 native load peaks, thus excluding wheeling and interchange customers. Capacity costs are allocated based on the average coincident load of each rate class or customer for each of the Top 200 native load peaks.

TVPPA recommends that capacity costs be spread throughout the year by plant based on actual generating hours and that the costs redistributed to each month be allocated to rate classes and customers based on monthly coincident peak. This allocation methodology produces an allocation virtually identically to a traditional 12CP allocation, with a less than one fourth of one percent variation. Based on this close cost relationship, TVA used the 12 CP capacity cost allocation to represent TVPPA's perspective.

TVIC agrees that capacity costs should be allocated over a relatively large number of coincident peaks, but prefers the Top 50 native load peaks as an approximation of all peaks within 5% of the annual native load peak.

8.1 Energy

Energy costs allocators generally assign costs based on energy usage with perhaps a time of use element. Common variations include average energy usage, average on peak and off peak usage, rate class or customer usage of the generation from each generating unit, and rate class or customer usage weighted by hourly marginal cost.

TVA's position is that energy costs are incurred unevenly throughout the year, the month, and the day, as less efficient or more expensive generation is dispatched to serve peak loads. In the absence of an independent power market from which to derive hourly marginal costs, TVA uses hourly power supply cost as a proxy. Actual embedded energy costs are allocated to each rate class or customer based on the hourly load-weighted incremental costs as a percentage of total system hourly load-weighted incremental costs. TVA refers to this methodology as "Resource Cost Allocation" or RCA.

TVPPA prefers the allocation of energy costs based solely on the usage of each rate class or customer without reference to the time of the usage.

TVIC favors the RCA methodology of allocating energy costs to rate classes or customers based on hourly load-weighted incremental costs.

9.1 Transmission

Transmission costs allocators generally assign costs based on the rate class or customer contribution to system peak in a manner similar to capacity costs allocations. Common variations include consideration of the annual system peak (1 CP), a weighting of peaks from a single season, the average of the twelve monthly coincident peaks (12 CP), the single non-coincident peak (1 NCP), and the average monthly non-coincidental peak (12 NCP).

TVA's position is that the transmission and ancillary services tariffs are calculated based on the assignment of the transmission and ancillary services revenue requirements to both native and non-native transmission customers using a 12 CP allocator and that to maintain parity between the non-native transmission customers and the various rate classes of native transmission customers, embedded transmission and ancillary services costs should be allocated on the same basis.

TVPPA's position is that transmission and ancillary services costs should be allocated to rate classes and customers based on a 12 CP allocator.

TVIC recommends that transmission and ancillary services costs be allocated to rate classes and customers on the same basis as capacity costs are allocated. It is their position that the transmission system, like the generation system, is built to serve the peak demands of the system.

10.1 Other

It is the consensus of TVA, TVPPA, and TVIC that other costs should be allocated on the basis of each rate class or customer allocated share of total capacity, energy, and transmission costs.

11.1 Allocations by Customer Class

The allocation of the costs presented in Table 1 to the three major rate classes based on the methodologies discussed above is shown in more detail below in Table 2. The loads for each rate class and the costs in each cost category are the same for each of the three perspectives presented.

The specific allocations vary by perspective and methodology but are consistent. Each of the methodologies allocates significantly more capacity and transmission costs per kWh to standard service than to large general service and large manufacturing service. Each of the methodologies allocates similar energy costs per kWh to each of the three rate classes. All three perspectives use the same proportional methodology to allocate other costs. Consequently, all three allocate more other costs per kWh to standard service than to large general service and large manufacturing service.

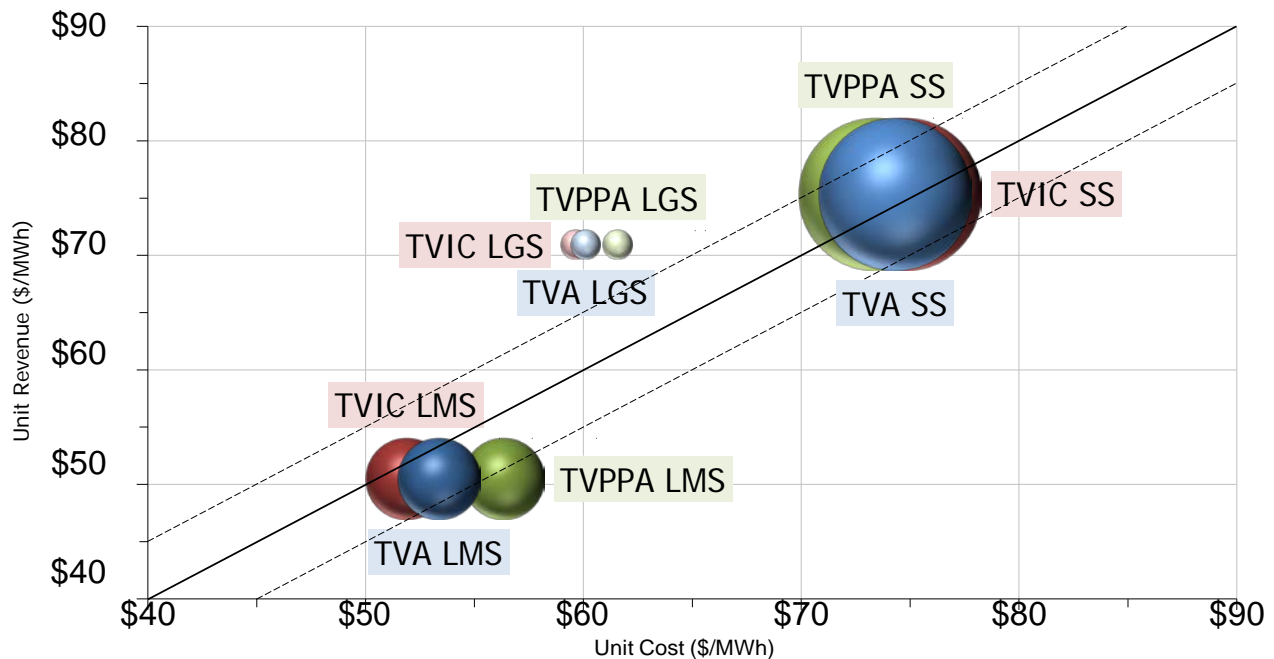
12.1 Table 2

TVA Perspective	Load GWh	Capacity	Energy	Transmission	Other	Total
<i>Standard Service</i>	117,692	\$ 3,587	\$ 2,308	\$ 718	\$ 2,134	\$ 8,747
<i>Large General Service</i>	4,221	94	79	19	62	254
<i>Large Manufacturing Service</i>	33,695	611	614	134	439	1,798
TVPPA Perspective	Load GWh	Capacity	Energy	Transmission	Other	Total
<i>Standard Service</i>	117,692	\$ 3,545	\$ 2,270	\$ 718	\$ 2,108	\$ 8,641
<i>G BCD</i>	4,221	96	81	19	63	260
<i>M BCD</i>	33,695	651	650	134	463	1,898
TVIC Perspective	Load GWh	Capacity	Energy	Transmission	Other	Total
<i>Standard Service</i>	117,692	\$ 3,611	\$ 2,308	\$ 733	\$ 2,147	\$ 8,799
<i>G BCD</i>	4,221	93	79	19	61	252
<i>M BCD</i>	33,695	588	614	119	426	1,748

MULTIPERSPECTIVE PRESENTATION OF RESULTS

In recognition of and with respect for the diversity among TVA's customers, the results of the fiscal year 2016 cost of service study are presented from three perspectives: TVA's, TVPPA's, and TVIC's. The cost of service study can be used to compare and contrast results among both the perspectives and the rate classes. This multiperspective presentation facilitates awareness and understanding of the sometimes competing priorities of fairness, affordability, and competitiveness. The perspectives are presented based on each party's preferred cost allocation methodologies and the resulting relationships of the revenue to cost ratios of the three previously defined aggregated rate classes to tolerance band around cost parity. The five dollar tolerance band around cost parity recognizes the differences among perspectives and the common goal for rates to recover underlying costs.

13.1 Chart 1



14.1 RESULTS

The **TVA** perspective is presented in blue in Chart 1 and is based on Top 200 allocated capacity, RCA allocated energy, 12 CP allocated transmission, and proportionally allocated other costs.

The **TVPPA** perspective is presented in green in Chart 1 and is based on 12 CP allocated capacity, average allocated energy, 12 CP allocated transmission, and proportionally allocated other costs.

The **TVIC** perspective is presented in red in Chart 1 and is based on Top 50 allocated capacity, RCA allocated energy, Top 50 allocated transmission, and proportionally allocated other costs.

The size of the bubbles is directly proportional to the volume of sales to each of the aggregated rate classes.

The three perspectives of estimating the cost to provide electric service to customer classes produced remarkably similar results. All three methodologies indicate approximately the same revenue to cost ratios for all three rate classes (LPC Standard Service, Large Manufacturing Service, and Large General Service). Furthermore, all three perspectives also concur that the aggregated Large General Service class has rates which currently generate revenues significantly in excess of their allocated costs.

15.1 CONCLUSIONS

The commonalities highlighted by the multiperspective approach provide a solid basis for moving forward with the October 2018 rate change. The differences point to areas for continued exploration in the future, both to clarify mutual understanding and to ensure rate structures and long-term directions are both competitive and equitable.

Appendix D: Public Comments on the Draft EA and TVA Responses

Introduction

The Draft EA for the proposed 2018 Wholesale Rate Change was released to the public on March 9, 2018. TVA accepted comments submitted by mail and email through April 9, 2018. During the comment period, TVA received 1,741 comment submissions on the Draft EA. One comment submission was received from the State of Tennessee Department of Environment and Conservation, nine from nongovernmental organizations, and the remainder were from private citizens and businesses. Of the 1,741 submissions, less than 10 raised substantive issues relating to TVA's analysis in the Draft EA. The remainder were more general in content. Most submissions (1,449) originated from one of four form letters: the Sierra Club submitted a letter cosigned by 725 members (Sierra Club Form Letter); 608 people sent a message originating from the Southern Alliance for Clean Energy (SACE Form Letter); 74 members of the Volunteer Energy Cooperative submitted a form letter; and 42 people voiced opposition in an form letter of unknown origin. Many individuals who submitted form letter comments added additional, unique statements. Nine submittals were received after the end of the comment period; no additional issues or concerns were raised in these submittals that had not already been raised in timely submittals and addressed below.

All of the comment submissions were carefully reviewed by TVA and the EA was edited and revised as appropriate. TVA notes that it did not respond to comments of general support for or opposition to the proposed rate change that did not include a specific reason, but made a note of the extent of the support or opposition. Comments were collated and summarized by TVA. In the table below, comments or summaries of similar comments and TVA's responses to them are provided. The comments were grouped in the following eight categories:

- I. General Comments
- II. TVA Purpose and Need
- III. Consistency with the TVA Act and TVA's Mission
- IV. TVA's Integrated Resource Plan
- V. Range of Alternatives
- VI. Socioeconomic Analysis
- VII. Environmental Impact Analysis
- VIII. NEPA Process

Table D-1. Public Comments and TVA Responses

#	COMMENTS	COMMENT STATEMENT OR SUMMARY OF STATEMENTS	TVA RESPONSE
I. GENERAL COMMENTS			
1	Appalachian Voices, Center for Biological Diversity, Memphis AARP Branch, Tennessee State Conference National Association for the Advancement of Colored People (NAACP) Environmental Justice Committee, SACE Form Letter, Sierra Club Form Letter, SACE, Sierra Club/Southern Environmental Law Center (SELC), J. Adams, V. Alexiades, T. Allen, W. Ammons, C. Aronson, D. Ashmore, J. Atkins, R. Ball, P. Banks, C. Barber, J. Barksdale, K. Beaty, N. Beavers, D. Bell, R. Bisonnette, B. Bivens, D. Boettner, D. Boitnott, D. Boles, R. Bonee, T. Boughan, B. Bowers, C. Bowman, S. Brendel, J. Brooks, S. Brooks, J. Brown-Hall, K&S Bruno, M. Bryant, T. Buffington, D&L Buletti, L. Burch, C. Burch, E. Burgess, D. Burgess, F. Burgess, J&M Burhans, H. Burris, K. Carey Jr, R. Carmichael, T. Case, P. Casteel, S. Chamberlin, L. Charles, P. Chavis, S. Chilton, DB Clark, JD Clark, D. Clemons, M. Cole, J. Colton, J. Conner, K. Cook, G&S Cook, L. Coulter, S. Creers, W. Daughterty, R. Daumiller, J. Deal, P. Dean, C&P Dearmom, E. Denton, J. Didicher, V. Dixon, C. Drumright, M. Dryja, R. Duncan, D. Dunn, AJ Dwenger, J. Dwenger, Earnie,	Commenters are opposed to the proposed rate change because it would increase the monthly electricity bill and create a financial burden to their or other households and businesses. The proposal would burden low or fixed income residents in particular.	<p>TVA understands that keeping electricity bills low is important to most consumers. In developing this proposal, TVA considered potential consequences to wholesale and retail bills, and has attempted to minimize unexpected adverse changes.</p> <p>Based on the analysis, TVA found that changes in the wholesale rate structure would have a small effect on consumers based upon each person's individual usage. Some residents would see overall lower bills, and some residents may pay \$1 to \$2 a month more on their energy bills if their local power companies choose one of TVA's recommended rate options.</p> <p>Consumers would still control their bills by choosing how much power they use and being more energy efficient. The new rate restructure would also better account for fixed costs, while still being based mainly on energy usage.</p> <p>This is being done to more fairly allocate costs: ensuring the cost of power is spread across everyone who benefits from access to the grid, and. The change would also help stabilize monthly bills.</p> <p>With this proactive change to our rate structure, TVA would continue to provide a stable foundation that gives</p>

#	COMMENTS	COMMENT STATEMENT OR SUMMARY OF STATEMENTS	TVA RESPONSE
	J. Eastman, P. Eberhart, T. Echols, R. Elliott, B. Elliott, S. Eubanks, S. Evans, B. Everett, P. Falk, L. Falk, K. Ferris, J. Finke, J. Flake, R. Ford, G. Ford, K. Foreman, K. Furgal, A. Fusco, S. Garrett, E. Geren, M. Gingerich, C. Goad, W. Goehl, J. Goehl, W. Golden, D. Green, M. Greeno, B. Grisham, D. Guill, M. Gulick, S&W Hale, K. Hall, M. Hamman, A. Harper, T. Harrington, R. Harris, D. Harris, JR Hartley, L. Heidkamp, C. Henry, JM Higdon, B. Hill, D. Holbrook, C. Holloway, K. Hooker, C. Hoover, S. Hritz, A. Hritz, A. Hultman, K. Hyche, T. Iovino, J. Irvin, B. Jackson, B. Jenkins, J. Jonakin, G. Jones, T. Jones, J. Jones, J. Keck, D. Kelz, N. Kennedy, Kerry, K. Khalili, S. King, B. Knisley, R. Knuth, C. Koczaja, E. Kohli, M. Lammers, R. Lamonda, C. Landis, C. Lane, E. Larson, N. Lee, J. Lee, M. Lees, D. Levins, N. Levison, T. Lewis, P. Lilly, S. Lockhart, H&V Longee, Lori, R. Lowe, A. Luttrell, R. Lynch, F. Lynch, C. Magli, L. Mallory-Elliott, C. Mantooth, L. Marchand, D. Matheny, A. Mayer, B. McCabe, T. McClary, J. McCoy, P. McCoy, S. McDonald, S. McFarlen, L. McKenna, D. McLeskey, B. Mentzer, A. Miller, Miranda, M. Mitchel, J. Mitchell, S. Monahan, M. Moore, P. Morello, B. Morello, H. Morgan, Herman Morris, H. Murphy, D. Neilson, G. Nelson, D. Nelson, J. Noble, N. Ottinger, D. Overbay, B. Paisley,		<p>the flexibility to embrace new trends, continue delivering more innovative energy options – and, most importantly, provide low rates for Valley residents for generations to come.</p> <p>Several of the commenters that expressed concern that the proposal would increase their electricity bills cited, anecdotally, to recent household electricity bills that exceeded \$400. TVA notes, based on their high electricity bills, that these commenters likely are high-volume users that would actually see decreases in their electricity bills under the proposed default retail rates (see section 3.3.2 of the EA).</p>

#	COMMENTS	COMMENT STATEMENT OR SUMMARY OF STATEMENTS	TVA RESPONSE
	J. Parks, S. Parris, J. Parsons-Flynn, R. Paxton, S. Peeples, R. Peeples, M. Pendergrass, R&D Pennycuff, C. Perry, R. Phelps, K. Phillips, M. Poley, S. Ponce, R. Powers, K. Presley, W. Prettyman, R. Price, C. Pupal, W. Rabert, S. Ramsey, D. Reed, J. Reed, A. Reels, J. Reid, D. Richards, C. Richeson, J. Rizzo, P. Robbennolt, DC Robbins, G. Robertson, L. Rosenblatt, L. Ross, D. Rowe, D. Royalty, D&L Rupert, D. Sapp, R. Satterfield, J. Schiller, C. Schmidt, H. Seffron, J. Settlemyer, K&J Shackelford, S. Sharitt, C. Shepherd, E&J Shewmake, B. Simmons, K. Singleton, G. Slagle, P. Slentz, T. Smith, B. Smith, J. Smith, M. Stanfill, J. Steitz, J&S Stephens, S. Stephens, Steve Turney, A. Storic, R. Storic, R.Storic, H. Storic, B. Swinford, S. Taylor, D. Thometz, S. Threet, L. Thurman, L. Tift, PL Tobey, E. Turner, C. Vandever, M. Vogel, GF Wade, B. Wallace, B. Watson, J. Welch, C. West, G. West, R. Westbrooks, M. Wettemann, G. Whitehead, L. Whitfield, TM Whiting, B. Wilborn, L. Williams, B&G Williams, J. Williams, A. Womac, R. Wood, J. Wright, S. Wyatt, S. York, B&A York, C. Young, B. Zarnoch, G. Ziegele, J. Ziegele, J. Zumstein		

#	COMMENTS	COMMENT STATEMENT OR SUMMARY OF STATEMENTS	TVA RESPONSE
2	<p>Appalachian Voices, Center for Biological Diversity, Memphis AARP Branch, Tennessee State Conference NAACP Environmental Justice Committee, SACE Form Letter, Sierra Club Form Letter, SACE, Sierra Club/SELC, J. Adams, V. Alexiades, C. Barber, J. Barksdale, N. Beavers, B. Bickel, B&N Bloomfield, DA Boettner, T. Boughan, B. Bowers, M. Briggs, J. Brown-Hall, P. Bryan, R. Burks, T. Burns, H. Burris, D. Bursch, A. Bush, M&S Calvert-Rosenberger, L. Charles, K. Cohen, C. Corbitt, ES Couch, D. Cross, J. Deal, P. Dean, C. Drumright, K. Ferris, K. Foreman, M. Gingerich, W. Goehl, J. Goehl, T. Grose, M. Hamman, M. Hardesty, J. Harkey, R. Harris, D. Harris, N. Hartert, JR Hartley, L. Haywood, L. Heidkamp, Lesley Herrmann, J. Hitch, D. Holbrook, C. Hooper, A. Hultman, K. Hyche, T. Iovino, P. Jackson, J. Jonakin, S. Kelley, R. Knuth, C. Koczaja, C. Lane, R. Lowe, L. Lynch, C. Magli, K. Marett, B. McCabe, L. McCall, S. McDonald, A. McFarlen, G. Miller, Miranda, J. Mitchell, S. Moffatt, R. Moore, M. Moore, P. Morello, B. Morello, Herman Morris, G. Neely, D. Nielsen, J. Noble, N. Ottinger, K. Parker, R. Phelps, JP Plumlee, M. Poley, S. Ponce, W. Prettyman, J. Reid, C. Richeson, JR Riddle, J. Rizzo, L. Ross, D. Royalty, D. Sapp, J. Schiller, C. Schmidt, T. Singleton, K.</p>	<p>Commenters are opposed to the proposed rate change because it would reduce the incentive for conservation, since it would likely reduce the amount of money an individual consumer (or company) could save by reducing their power usage. The rate change would reduce the benefit of choosing energy efficiency or locally site solar generation, and will discourage the growth of energy efficiency and DER. Under TVA's proposed approach, consumers will have less incentive to either reduce their energy use or invest in distributed solar, but more incentive to simply use more energy. Energy conservation and efficiency should be encouraged.</p>	<p>Consumers' behavior and weather are primary factors in energy bills. This would continue to hold true under TVA's proposed rate change. Valley residents would still control their energy bills by choosing how much electricity they use and being more energy efficient.</p> <p>TVA's proposed rate change would not hurt the ability of consumers to take actions to reduce their monthly electricity bills. There would still be incentives for consumers to conserve electricity. Bills would continue to be determined primarily by usage: more electricity usage would result in higher bills to the consumer, whereas less electricity usage would result in lower bills. Because the proposed rate change would affect only a small portion of consumers' electricity bills, consumers would continue to benefit from implementing energy efficiency practices.</p> <p>In addition, TVA found in its analysis that the rate change in Alternative C1 (preferred in the final EA) would be unlikely to substantially influence the rate of investment in DER among retail consumers.</p> <p>As discussed in the EA 2.3.1, the LPCs may implement the proposed rate change with default, optional, or customized retail rates. Regardless of which option the LPCs choose, the proposed wholesale rate change would appropriately reward energy efficiency and investment in DER. Under the negotiated preferred alternative, C1, the 1/2 cent grid access charge would recover less than 8</p>

#	COMMENTS	COMMENT STATEMENT OR SUMMARY OF STATEMENTS	TVA RESPONSE
	<p>Singleton, P. Slentz, j. Steitz, S. Stephens, B. Swinford, M. Taylor-Poleskey, D. Thometz, L. Tift, PL Tobey, K. Todd, J. Vance, GF Wade, B. Wallace, B. Wallace, M. Walton, G. Wathen , R. Westbrooks, M. Wettemann, L. Whitfield, TM Whiting, S. Williams, L. Williams, J. Williams , J. Wohlgemuth, A. Womac, R. Wood, E. Zubko</p>		<p>percent of TVA fixed costs through the wholesale grid access charge.</p> <p>To help better manage energy usage, TVA offers eScore™ – a program developed through a partnership between TVA and local power companies to provide homeowners with a simple way to make existing homes as energy-efficient as possible. If interested, learn more at the eScore website. Consumers can find additional information and tips from TVA about how to save money, and energy, and lower electricity bills here. They can also reach out to their local power companies for advice and programs available in their area.</p>
3	<p>Memphis AARP Branch, Tennessee State Conference NAACP Environmental Justice Committee, SACE Form Letter, Sierra Club Form Letter, F. Adom, C. Aronson, B&N Bloomfield, DA Boettner, M. Briggs, J. Brooks, P. Bryan, T. Burns, M&S Calvert-Rosenberger, ES Couch, P. Dean, M. Dillman, J. Eastman, B. Elliott, K. Foreman, T. Grose, M. Hardesty, L. Haywood, K. Hyché, C. Johnson, B. Knisley, R. Knuth, C. Koczaja, N. Lambeck, C. Landis, N. Levison, E. Lewis, R. Lowe, J. Marlin, L. McCall, A. McFarlen, J. McIntosh, M. Moore, Herman Morris, K. Parker, JP Plumlee, S. Ponce, JR Riddle, D. Sapp, D. Scher, J. Schiller, P. Slentz, J. Smith, J. Steitz, M. Stewart, K.</p>	<p>Commenters are opposed to the proposed rate change because it reduces or eliminates the incentive for consumers to evaluate, invest in and use alternative energy sources.</p>	<p>In its assessment, TVA found that the proposed rate change would only marginally influence the rate of investment in energy efficiency and DER among retail consumers. The incentive to invest in energy efficiency and alternative energy sources such as DER would not be eliminated; it would be marginally decreased, assuming that households pursuing DER use above-average amounts of electricity. TVA has added additional information to the EA regarding potential changes in investment of DER. TVA estimates that the payback period of a typical rooftop solar investment would increase from approximately 15 to 16 years. As addressed in section 3.3, literature suggests that this change would not result in a significant change in DER investment.</p> <p>The proposed rate change would balance a fiscally</p>

#	COMMENTS	COMMENT STATEMENT OR SUMMARY OF STATEMENTS	TVA RESPONSE
	<p>Todd, R. Trahan, J. Vance, G. Wathen, B. Watson, M. Wettemann, L. Whitfield, TM Whiting, S. Williams, K. Wilson, R. Wood, Ed. Zubko</p>		<p>responsible fixed charge with maintaining a usage-based energy rate that does not discourage energy efficiency or investment in DER.</p> <p>TVA has determined that the current pricing structure over-incentivizes consumer installation of DER without a corresponding benefit in reducing TVA's costs or the costs of other Valley customers, and, without a rate change, over time, the imbalance created by DER investment would inequitably shift costs to consumers throughout the Valley who cannot afford to or do not choose to invest in DER.</p> <p>In addition, the current over-incentivation for small-scale DER investments reduces the impetus for utility-scale investment in renewable energy generation, including solar. Utility-scale renewable energy costs substantially less per unit of energy than small-scale DER, benefiting all retail consumers, not only those who purchase their own DER.</p>
4	<p>Memphis AARP Branch, Tennessee State Conference NAACP Environmental Justice Committee, SACE Form Letter, Sierra Club Form Letter, B&N Bloomfield, N. Hartert, A. Hultman, S. Kelley, Lesley Herrmann, L. McCall, R. Moore, Herman Morris, S. Ponce, JR Riddle, J. Rizzo, G. Robertson, B. Steffey, E. Zubko</p>	<p>Commenters are opposed to the proposed rate change because a grid access fee reduces the consumer's ability to control their electricity bill by using less electricity, using energy efficient appliances, and/or using distributed energy resources such as solar.</p>	<p>The proposed wholesale standard service grid access charge applies only to wholesale power bills for LPCs. TVA's proposed default retail rate structure for LPC retail customers does not include a retail grid access charge. LPCs may choose an alternative rate structure that would have to be approved by TVA, and TVA would limit the amounts of retail grid access charges (see the Implementing Guidelines description in Chapter 2 of the EA). Regardless, a significant portion of each bill would</p>

#	COMMENTS	COMMENT STATEMENT OR SUMMARY OF STATEMENTS	TVA RESPONSE
			continue to be based on volumetric energy charges. As such, customers would still be able to reduce their bills by reducing energy use, such as by investing in energy efficient appliances or solar DER.
5	SACE Form Letter, C. Aronson, K. Beaty, S. Brendel, M. Bryant, L. Burch, C. Burch, E. Burgess, D. Burgess, F. Burgess, J&M Burhans, K. Carey Jr., T. Case, T. Case, S. Chamberlin, S. Chilton, DB Clark, JD Clark, K. Cohen, J. Conner, K. Cook, G&S Cook, S. Creers, W. Daughterty, P. Dean, E. Denton, V. Dixon, M. Dryja, D. Dunn, AJ Dwenger, J. Dwenger, T. Echols, B. Everett, G. Ford, A. Fusco, B. Grisham, M. Gulick, S. Hawkins, C. Henry, C. Hoover, A. Hultman, B. Jenkins, S. Johnson, T. Jones, J. Jones, J. Knight, M. Lammers, R. Lamonda, E. Larson, N. Lee, J. Lee, Lesley Herrmann, R. Lowe, L. Mallory-Elliott, K. Marett, D. Matheny, J. McCoy, P. McCoy, L. McKenna, T. McKnight, A. Miller, D. Neilson, D. Nelson, S. Parris, R. Paxton, S. Peebles, R. Peebles, M. Pendergrass, K. Phillips, C. Pupal, W. Rabert, J. Reed, A. Reels, C. Richeson, P. Robbennolt, DC Robbins, D&L Rupert, J. Scott, J. Settlemyer, T. Smith, B. Smith, J. Smith, M. Stanfill, A. Storic, R. Storic, R. Storic, H. Storic, E. Turner, R. VanWinkle, M. Vogel, G. Wathen, G.	<p>Commenters are opposed to the proposed rate change because the proposal favors industrial and large customers and hurts residential consumers. TVA intends to add additional fees to its electric rate and continue to bill residential and commercial customers at higher rates, while giving large industrial customers massive rate discounts. TVA's past decisions around rates and these proposed changes do not honor the TVA Act. Shifting additional costs onto residential customers and away from industrial customers is against TVA's statutory requirement that rates should be structured in a way that prioritizes and benefits the residential customers of the Valley. These higher-users are unfairly receiving "discounts," "subsidies," "rebates" or "credits."</p> <p>Some commenters asserted that the proposed rate change would result in residential consumers having to pay 0.3% more for the electricity they use to the benefit of the industrial class.</p>	<p>As noted in the EA, cost of service studies conducted by TVA for recent years have demonstrated an excess of the revenues collected from large general service consumers over the costs incurred by TVA to serve these consumers (see Appendix C for the most recent Cost of Service study). Benchmarking studies place TVA in the 4th quartile (the bottom 25% among peers) for commercial rates. The current rate structure (Alternative A) conflicts with two of TVA's objectives in setting rates: that revenue be recovered in proportion to costs by customer class; and that rates be competitive. These conflicts under the current rate structure would be further exacerbated in the future, magnifying the cost shift from DER to non-DER customers and making commercial rates less competitive.</p> <p>TVA's proposal would reduce the revenue collected from large commercial consumers (e.g., hospitals, universities) by approximately 8% and would increase slightly the revenue collected from both industrial and residential and small commercial consumers by approximately 0.3%. The intent is not to favor any consumer class but, rather, to correct the portion of the revenue unfairly collected from large commercial customers under the current rate structure.</p>

#	COMMENTS	COMMENT STATEMENT OR SUMMARY OF STATEMENTS	TVA RESPONSE
	Whitehead, S. Wyatt, S. York, B&A York, B. Zarnoch, G. Ziegele, J. Ziegele		<p>The combined effect of the various rate change components would be an increase of about 1% in large manufacturing rates. The decrease in large general service rates, the rebalancing of the hydro allocation debits, and the change in the fuel cost allocation would impact rates for large manufacturing customers.</p> <p>The proposed rate change would not result in residential consumers paying 0.3% more electricity to benefit industrial customers. TVA's proposal would lower the rates on the large commercial class. The large industrial customers would get the same 0.3% increase as the Standard Service customers, which includes small commercial consumers as well as residential consumers. There are approximately 80 large commercial customers that would get a rate decrease, including 9 federal government facilities, 15 universities, 12 hospitals, 10 water and sewer systems, 2 airports, and 1 prison. The proposed rate would move no costs from industrial consumers to the residential consumers.</p>
6	SACE Form Letter, Sierra Club Form Letter, J. Adams, V.Alexiades, J. Atkins, C. Barber, N. Beavers, T. Boughan, B. Bowers, M. Briggs, S. Brooks, J. Brown-Hall, H. Burris, L. Charles, J. Deal, C. Drumright, K. Ferris, M. Gingerich, W. Goehl, J. Goehl, R. Harris, D. Harris, T. Iovino, J. Jonakin, S. Kelley, R. Knuth, C. Lane, L. Lynch, B. McCabe, A.	<p>Commenters oppose the proposed rate change because higher fixed charges reduce the economic return from saving energy and generating your own electricity at home with solar panels or other types of distributed energy technology. Other sample statements include:</p> <ul style="list-style-type: none"> - The fixed grid access fee would harm anyone who has made a personal and financial investment in energy 	TVA has added information to the EA regarding DER investment (see section 3.3) and has concluded that investment in DER would only marginally slow the projected growth of DER. TVA estimates that the payback period of a typical rooftop solar investment would increase by about one year from approximately 15 to 16 years. Literature suggests that this change would not result in a significant change in DER investment. As such, there

#	COMMENTS	COMMENT STATEMENT OR SUMMARY OF STATEMENTS	TVA RESPONSE
	McFarlen, J. Mitchell, P. Morello, B. Morello, H. Murphy, J. Noble, N. Ottinger, R. Phelps, JP Plumlee, M. Poley, S. Ponce, J. Reid, C. Richeson, L. Ross, D. Royalty, C. Schmidt, K. Singleton, M. Stanfill, J. Steitz, B. Swinford, D. Thometz, L. Tift, PL Tobey, GF Wade, B. Wallace, M. Walton, R. Westbrooks, L. Whitfield, L. Williams, A. Womac	<p>efficient systems, to include appliances, solar, wind and geothermal systems or any other energy generation or conservation method.</p> <ul style="list-style-type: none"> - The proposal would reduce the effectiveness and financial return of energy conservation investments already made. - It penalizes Tennesseans who have already invested in energy efficiency upgrades and energy efficient appliances. - Moving TVA's cost recovery into a fixed charge and away from a volumetric rate also makes the financing for beneficial investments in solar and energy efficiency much more difficult. - If the grid access fee is enacted and the consumer rate is lowered, the investment in and development of renewable energy sources, like solar power, will be greatly hampered. 	<p>would be little change in the influence of DER on environmental and socio-economic concerns.</p> <p>TVA also notes that for existing DER investments where rates are specified by contract, the time for those investments to break even would not be affected.</p>
7	W. Ammons, J. Atkins, C. Flaherty, K. Foreman, D. Grantham, R. Greer, A. Harper, D. Hart, C. Hess, M. Kelley, A. Mayer, G. Rawdon, R. Wood, Miranda	<p>Commenters oppose the proposed rate change because they believe requiring customers to pay a fixed charge is unfair. Sample statements include:</p> <ul style="list-style-type: none"> - Utilities should be charged based on consumption rather than arbitrary fees. - We pay for the electricity we use not for the privilege of having electricity. - I do not want to pay a fixed-rate grid access fee. I want to pay based on the volume of electricity I consume. That is the only fair way to charge a person. - The proposed change is an unfair regressive plan, imposing higher fixed rates on all customers regardless of income. 	<p>The proposed wholesale grid access charge is a fixed charge. Fixed charges are necessary for rate equity among our wholesale customers. To serve each of the nearly 10 million customers in the Valley, TVA makes investments in generation, transmission, and other facilities, and we must maintain those facilities to ensure reliability and safety. The cost of maintaining these facilities does not change, even if LPCs buy less electricity during a specific period. The cost of these services are appropriately billed as a fixed wholesale grid access charge each month rather than in proportion to the amount of electricity purchased.</p>

#	COMMENTS	COMMENT STATEMENT OR SUMMARY OF STATEMENTS	TVA RESPONSE
			<p>An important objective for TVA in implementing the proposed rate change is to ensure that each customer class pays its fair share of fixed costs. Under current electric rates, DER create cost-shifting from customers with DER to those without. Retail consumers with DER connected to the grid currently offset retail electricity purchases at the retail energy rate. Because the retail energy rate is higher than TVA's marginal cost of providing electricity (even after accounting for avoided TVA costs), TVA effectively loses revenue on energy that DER users send to the grid. Stated another way, the compensation paid for DER electricity is greater than the corresponding reduction in costs.</p> <p>Because most of TVA's costs of providing energy for Standard Service (which includes residential customers) are recovered through variable energy charges rather than fixed charges, DER can prevent TVA and LPCs from recovering their full costs. This is not unique to TVA; a California Public Utility Commission report found that customers with DER on average pay just 81 percent of the cost to serve their electricity needs (CPUC, 2013). Due to the costs of installing these systems, customers installing DER tend to have above-average incomes. The cost shifting, therefore, typically benefits households with above-average incomes at the expense of less well-off households.</p> <p>TVA would apply the wholesale standard service grid</p>

#	COMMENTS	COMMENT STATEMENT OR SUMMARY OF STATEMENTS	TVA RESPONSE
			access charge to each LPC's Standard Service purchases. While the exact changes in retail customers' monthly bills would vary by LPC, TVA projects that the changes would likely be similar across the TVA service area.
8	J. Schiller	TVA's proposal to increase its fixed rate charge violates long established principles of fair rate design.	<p>The TVA proposal conforms to the criteria identified for a sound rate structure by James C. Bonbright in his cornerstone treatise, "Principles of Public Utility Rates" (1961). The proposed rate change addresses, in particular, the principles of revenue stability, rate stability and fairness. Bonbright's principles include:</p> <ul style="list-style-type: none"> • Simplicity, understandability, public acceptability • Feasibility of application and interpretation • Effectiveness of yielding total revenue requirements • Revenue (and cash flow) stability from year to year • Stability of rates themselves, minimal unexpected changes that are seriously adverse to existing customers • Fairness in apportioning cost of service among different consumers • Avoidance of "undue discrimination" • Efficiency, promoting efficient use of energy and competing products and services
9	L. Lynch, R. VanWinkle	Commenters oppose the proposed rate change because TVA should cut its waste rather than raise rates on its consumers.	Many commenters mistakenly characterized the proposed rate change as a rate increase. While the rate change may result in higher electricity bills for some consumers (as discussed in the EA), the proposed rate change is not a rate increase and is not proposed as a means for TVA to gain additional revenue. The action would be revenue-neutral for TVA because the wholesale grid access charge would be implemented along with a corresponding

#	COMMENTS	COMMENT STATEMENT OR SUMMARY OF STATEMENTS	TVA RESPONSE
			reduction of the wholesale Standard Service energy rate. TVA places a high priority on fiscal responsibility. In recent years, TVA has implemented significant cost-cutting measures that have reduced its annual operating costs by more than \$800 million. TVA will continue to seek ways to reduce costs into the future. The proposed rate change would not reduce TVA's incentive to be efficient.
II. TVA PURPOSE AND NEED			
10	Appalachian Voices	TVA's justification of the need for a rate change is unfounded. TVA's asserts that it needs to improve the current alignment of whole rates with their underlying costs of service and to diminish cost-shifting among consumers. TVA also asserts that the proposed rate change is needed because of future growth of DER. Neither assertion is supported by TVA's own data, which shows that merely 0.2% of TVA's total solar generating capacity. In the future, TVA projects that DER could grow to 2% of total generating capacity by 2030. Based on this data, it is clear that the "problem" which TVA is using to justify the proposed rate change is a strawman set up by TVA to entrench its antiquated business model and disincentivize customer-owned, customer generated renewable energy development as well as efficiency investments.	Table 1 of Appendix C (Cost of Service Fiscal Year 2016) of the draft EA shows that while approximately 72 percent of all costs are fixed; approximately 95 percent of revenue is collected through variable (volumetric) charges (kW and kWh). Consistent with the recommendation of NARUC, TVA is pursuing the rate change at this time to ensure a smooth transition for customers rather than waiting and having to respond with an aggressive change in rate structure in the future (NARUC 2016). TVA's goal is to integrate the use of customer-owned DER, but not at the expense of customers who cannot afford to purchase DER or otherwise do not choose to pursue DER. NARUC warns utilities not to wait until DER rates are high before adopting corrective policies (see page 3 of the EA).

#	COMMENTS	COMMENT STATEMENT OR SUMMARY OF STATEMENTS	TVA RESPONSE
11	Appalachian Voices, Herman Morris, Tennessee Advanced Energy Business Council Memphis AARP Branch, Tennessee State Conference NAACP Environmental Justice Committee	<p>In its Draft EA, TVA states that "the proposed changes will reduce upward rate pressure by mitigating the effects of uneconomic DER development.. ." Yet nowhere in the Draft EA does TVA adequately define or quantify what it means by "uneconomic," nor at what percentage DER growth becomes uneconomic for TVA ratepayers at large.</p> <p>The draft EA states, "TVA's current energy prices over-incentivize consumer installation of DER," and the "imbalance created by uneconomic DER investment means that costs are shifted to consumers throughout the Valley who do not invest in DER." Supporting documentation is not provided for either of these assertions. Understanding the inputs to these statements are important factors to determining market conditions, consumer demand (end users), economic impacts, and potential cost-shifting.</p>	<p>TVA has revised section 1.1 of the EA to clarify its use of the term "uneconomic" to describe certain DER installations (footnote 1). TVA considers DER to be "uneconomic" when the cost of energy derived from the DER is greater than the cost of the energy if provided by the local power company or directly by TVA.</p> <p>Due to the nature of the current rate design, DER installations may be "economic" for the individual or company that installs them but may be "uneconomic" for the Valley or other ratepayers. Under the current rate structure, an individual consumer's savings in energy costs would be the retail cost of the energy, less the cost of the installed DER. However, the LPC's and TVA's savings attributable to the DER would be generally limited to the fuel cost that would have been incurred to supply the energy from TVA generation. The system as a whole will lose more revenue than it saves in costs and overall rates will rise.</p> <p>Utility-scale solar installations cost substantially less to serve Valley energy needs than smaller, local installations, which benefit their purchasers at the expense of other Valley electric consumers. Consequently, small-scale installations are referred to as "uneconomic."</p>
12	TenneSEIA	The EA states TVA's concern that "current energy prices over-incentivize consumer installation of DER, leading to uneconomic results for the people of the Valley as a whole." This concern only exists because TVA approaches emerging technologies as a risk instead of an opportunity	Comment noted. See the response to comment 11 for clarification on use of the term "uneconomic" in the EA. See the previous response to comment 10 for an explanation of why TVA is pursuing the rate change at this time.

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		to change the TVA business model in a way that protects consumer choice and promotes efficiency and renewable technologies, such as solar energy. TVA's draft 2018 EA suggests that the changes it proposes are minimal and non-impactful. If so, they are unnecessary.	
13	Sierra Club/SELC	<p>Although TVA claims that the purpose of its proposal is to somehow better align wholesale rates with “underlying costs” (Draft EA, 1), TVA does not actually supply any assessment of what those underlying costs might be, or how current rates fail to “align” with those costs. Instead, TVA suggests a merely theoretical problem that might afflict it in the future in some hazy way: TVA has not yet undertaken the sort of forecasting necessary to assess what shifts in its customer base’s consumption and generation patterns are likely to occur, what impacts those shifts may have, and what potential changes to rate structures might be appropriate.</p> <p>In fact, although the Draft EA fails to mention it, TVA currently is embarked on a new IRP that, properly executed, could well provide such information. One aspect of the ongoing IRP process is to revisit TVA’s long-range plans in light of flat and declining sales having nothing to do with DER on the one hand, and in the face of growing demand for energy efficiency and such distributed resources on the other. This pending IRP process could identify costs savings from retirement of unneeded existing assets and other factors that would influence the “underlying costs” of operating the TVA system—necessary information for properly identifying any purpose and need for a proposed wholesale rate change.</p>	<p>Appendix C of the EA includes the 2016 Cost of Service study outlining TVA’s costs. See the previous response to comment 10 for an explanation of why TVA is pursuing the rate change at this time.</p> <p>TVA conducts integrated resource planning to meet future power demand by identifying the need for generating capacity and determining the best mix of resources to meet the need on a least-cost, system-wide basis. Integrated resource planning results in TVA selecting a power supply mix that meets the future power demand. In contrast, TVA’s rate restructuring proposal is not a supply-side proposal, but rather a proposal to better align wholesale rates with the underlying costs to provide service under the existing generation portfolio. The proposed rate action would not alter TVA’s current generation portfolio. Any action taken by TVA with respect to the rate restructuring proposal would not influence TVA’s ultimate decision in selecting a target supply mix for the 2019 IRP. Accordingly, the decision on the rate change proposal may be taken even while work on the 2019 IRP is in progress.</p>

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14	Sierra Club/SELC	<p>TVA does not include in the Draft EA any information indicating that there is actually a problem at all to be solved by its proposed rate change—at least not a problem caused by DER. Nor is it likely that TVA could make such a showing, because the level of DER adoption in place in TVA's service territory is very low.</p> <p>TVA fails to provide any quantitative evidence of any such purported cost shift currently occurring or projected to occur. The need for a rate structure change that penalizes DER is speculative at best, as TVA appears to acknowledge, suggesting that the “problems” with DER that TVA claims necessitates a rate change would “likely” worsen over time.</p>	<p>Based on the public's input, TVA has revised section 1.1 of the EA with information relating to cost shifting. The new information includes estimates from TVA that residential rooftop solar penetration of 2% anticipated by TVA forecasters over the next decade would equate to installations at approximately 80,000 households. Higher use customers would be more apt to pursue rooftop solar; at an average usage level of 2,500 kWh per month, rooftop solar would displace approximately 30% of each such consumer's total usage. This usage at a residential effective rate of \$0.10 per kWh and a fuel cost of \$0.025 per kWh would result in a cost shifting of approximately \$54 million annually. Although residential rooftop solar is not the focus of the proposed wholesale rate change, those shifted costs over 10 years would result in over half a billion dollars of unfair cost shifting to non-participants.</p> <p>As stated in section 1.1, of greater immediate concern are costs shifted from commercial and industrial customers. As described in additions to the EA, there are a number of customers that are taking on sustainability goals and committing to purchase up to 100% of their energy resources from renewable resources (RE100) that without appropriate rate structure changes will unfairly shift costs to non-participants, including residential consumers. TVA has estimated that commercial and industrial demand for renewable energy may be greater than 2,500 GWh by 2025. That level of renewable energy could create an additional cost shift of \$46 million dollars a year. From 2020 through 2030, this would create an additional unfairly</p>

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			shift of approximately half a billion dollars.
15	Sierra Club/SELC	Because TVA has not provided any evidence of a DER-induced cost shift, or articulated how the “grid access charge” is connected to the actual cost of accessing the grid, it is not at all demonstrated that the utility’s rate proposal is designed to address those issues.	<p>As noted above, forecasted growth in installed DER and in the demand for renewable energy would result in over \$100 million annually in inequitable cost -shifting from DER to non-DER users within the next few years.</p> <p>TVA's proposed wholesale standard service grid access charge would be a fixed monthly wholesale charge to the local power companies (LPCs). The fixed charge would recover a small portion of TVA's fixed costs. As noted in Appendix C of the EA, TVA's fixed costs for fiscal year 2016 were approximately \$7.8 billion. The proposed rate change would collect \$0.6 billion (less than 8%) of those fixed costs through the wholesale grid access charge. The LPCs would translate the wholesale grid access charge to retail rates. TVA has proposed both default and optional retail rates designs which would perform that translation without creating undue bill impacts on retail customers while ensuring that LPCs recover their power costs so that they are able to continue to serve consumers.</p>
16	Center for Biological Diversity	According to the EA, TVA is facing “competitive and technological changes” that threaten its “business model” because “distributed generation, energy efficiency, technological advances, [and] shifts in customer behavior” are reducing the amount of electricity customers want to receive from TVA, and thus its ability to generate income. 2018 Rate Change EA, at 1. Rather than embrace these opportunities to reduce reliance on dirty fuel sources that pollute the air and exacerbate climate change – which	TVA's statutory mission is to provide clean, reliable energy at the lowest feasible cost, to be stewards of the environment, and to promote economic development. The commenter mischaracterizes TVA's concerns and the underlying need and objectives for the proposal. To provide energy at rates as low as feasible, as explained in the EA, TVA cannot over-incentivize DER or allow the shifting of costs to those who cannot afford DER or otherwise do not choose to pursue DER.

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		would be consistent with TVA's statutory mission – the EA reveals that TVA is focused on making sure that these developments, in fact, do not reduce TVA's stranglehold on energy production. Thus, under the guise of protecting consumers from "cost-shifting," TVA has designed rate changes that encourage consumers to use more energy, while discouraging them from producing their own energy through distributed energy generation.	See TVA's responses above addressing the proposal's impact on energy conservation and efficiency as well as distributed energy generation. See TVA's responses below addressing the proposal's consistency with the TVA Act.
17	Center for Biological Diversity	TVA cannot have it both ways. If the 2018 Rate Change is not going to alter consumer behavior and thus will have no quantifiable impacts on TVA's central generation of power, then the proposed action does not serve its purpose and may not proceed. Alternatively, if the 2018 Rate Change will impact consumer adoption of DER and reliance on TVA central station power, NEPA requires that TVA actually consider the environmental impacts that will flow from the additional reliance on coal and other fossil fuel sources that will be the inevitable result of the 2018 Rate Change.	TVA's proposed rate change would not noticeably impact its power generation and operations because it is intentionally designed to be a small, measured change. The proposal is designed to help ensure that DER participants pay their share of system costs rather than shifting them to customers who cannot afford DER or otherwise choose not to pursue DER. Among TVA's guiding principles of rate design is to provide rate stability and to make changes gradually. Investment in DER may be slowed marginally, but not in a way that would increase TVA's reliance on coal or other fossil fuels. In fact, the proposed rate change will not cause TVA to change the operation of its transmission and generation system, or alter that system.
18	SACE	Despite claiming that increased penetration of DER on TVA's system is one of the primary reasons TVA needs to revisit its rate structure, TVA barely analyzes DER investment by residential customers. To the extent that TVA quantified DER penetration in its service territory, the impacts on TVA's system generation were forecast to be small. As noted above, TVA conducted quantitative analysis of DER investments by commercial customers and shared that information with TVPPA committees in	The comment mischaracterizes the analysis previously performed in the course of the proposed rate change. At the time, TVA did not quantitatively analyze DER investments by commercial customers. Instead, TVA performed an analysis of commercial customers with contract demands greater than 5 MW, which demonstrated that the current rate levels and rate structure make DER cost-effective for almost all large commercial customers, at the expense of other consumers.

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		<p>“deliberative and pre-decisional privileged” materials. However, nowhere in the materials provided to SACE did we see any quantitative analysis of DER investment by residential customers. TVA claims that its proposed structural rate change is aimed to stabilize its finances, and address reduced customer consumption. However, TVA has made no apparent adjustments to its models, programs, or estimates regarding the implications of all DER technologies on its operations, particularly electric vehicles. Another problem with TVA’s overall “case for change” is that it fails to consider the dynamics of the solar plus battery storage.</p>	<p>The comment further mischaracterizes the purpose of the proposed rate change "to stabilize its [TVA's] finances." As stated in the EA, the purpose of the proposed rate change is to refine the structure of its wholesale electric power rates through pricing that better aligns wholesale rates with underlying costs. The proposed rate change is designed to improve the alignment of pricing with costs regardless of whether a customer implements DER or what type of DER is implemented.</p>
19	C. Barber, G. Ford, M. Moore, J. Schiller, Tennessee Advanced Energy Business Council, G. Wathen	<p>TVA should document and disclose the costs that will be allocated to this charge and how they are considered to be “fixed.” TVA does not provide information on what the fixed cost actually will be or how the underlying costs are divided between grid transmission infrastructure and amortized capital expenditures for generation units.</p> <p>Several commenters also stated that TVA has not fully disclosed what this proposal means and should be more transparent in conducting its business.</p>	<p>TVA’s budget, revenues, and expenses are subject to annual public review at each August Board meeting. Costs incurred by TVA in conducting business are routinely disclosed to the public. As shown in Table 1 of Appendix C, TVA’s fixed costs were approximately 72% of TVA’s total costs in 2016. The proposed wholesale standard service grid access charge would recover less than 8% of TVA’s fixed costs.</p> <p>TVA’s methodology for classifying and allocating costs is outlined in detail in Appendix C, in section 5.1. As noted therein, costs fall into two broad categories: fixed and variable. Fixed costs do not vary in relation to generation or sales. Variable costs vary directly in relation to generation or sales.</p> <p>The FERC Uniform System of Accounts for Electric Utilities is used by TVA and throughout the electric utility industry. Table 1 in Appendix C section 5.1 lists the cost</p>

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			<p>categories used by TVA for cost of service functionalization and classification and provides the specific FERC account numbers, their descriptions, and the amounts and percentages of total costs as categorized for fiscal year 2016.</p> <p>Generation costs are classified as either capacity or energy. Capacity costs are costs incurred to generate electricity that do not vary with generation, and are considered fixed. Energy costs are costs incurred to generate electricity that vary with generation and are considered variable. Transmission costs are the costs associated with the transmission of power through the TVA system, from the generation source or interchange point to customer delivery points. Transmission costs are considered fixed.</p> <p>Other costs are costs not associated with generation or transmission. Other costs include flood control, public lands stewardship, amortization of regulatory assets, customer service expenses, and payments in lieu of taxes. Other costs are generally fixed.</p>
20	Center for Biological Diversity	TVA counter-intuitively asserts that there will be “no variation in impacts to the environment among the alternatives.” EA at 16. According to the EA, none of the alternatives will change customer behavior in a manner that would modify TVA’s power generation operations. Id. Thus, according to TVA, a rate change expressly designed to reduce the number of customers who generate	The commenter mischaracterizes the purpose of the proposed rate change. TVA’s intention is to reduce the incentive for uneconomic DER. The proposal is designed to help ensure that customers who use the grid pay their fair share of the cost of the grid. In addition, the rate proposal was not designed to incentivize additional energy use. In its analysis in the EA, TVA finds that there would

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		renewable energy, and to incentivize additional energy use, will have no actual impact on TVA's operations.	be little to no impacts to either customer usage or to power generation.
21	Center for Biological Diversity	<p>TVA's arguments—that distributed generation at TVA's current levels threaten low-income communities via cost-shifting and that there would be "more stability" with less distributed solar, implying that only high-income customers can afford solar—are not supported by the facts.</p> <p>First, distributed solar serves to increase grid resiliency benefits as well as add value as a solution to hedge against long-term volatile fossil fuel prices. The argument for preventing distributed solar expansion in order to improve stability for low-income customers is in any event a farce; TVA asserts that Alternatives C and D would benefit low-income communities by lessening seasonal bill fluctuations, but without evidence to back this claim. TVA also acknowledges that these alternatives all have the potential to increase monthly bills for the majority of customers, but fails to explain what this increase would be or how it will impact electricity bills for low-income customers.</p> <p>Second, although it is true that solar owners tend to have higher incomes than the national average, it is not true that the majority of solar owners are high-income or that low- and middle-income homes do not invest in solar [studies cited]. Distributed solar can also provide long-term</p>	<p>TVA has made revisions to section 3.3.2 of the EA (Socioeconomics) in response to public requests for additional information. Several tables and figures in this section of the EA depict potential bill impacts to communities. TVA has also added to and clarified the discussion of potential economic impacts to low-income consumers.</p> <p>As stated in the EA, the purpose of the proposed rate change is to refine the structure of its wholesale electric power rates through pricing that better aligns wholesale rates with underlying costs. TVA's proposed rate change would not dramatically alter generation and usage because it is intentionally designed to be a small, measured change. The proposal is designed to help ensure that DER participants pay their fair share of system costs rather than shifting them to customers who cannot afford DER or otherwise do not choose to pursue DER. Among TVA's guiding principles of rate design are the principles of providing rate stability and making changes gradually.</p> <p>TVA acknowledges that approximately 70% of the monthly</p>

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		<p>financial benefits to families struggling with high and unpredictable energy costs and a source of clean energy sited in communities that have been disproportionately impacted by pollution and climate impacts from traditional power generation.</p> <p>Finally, the solar industry also offers employment opportunities that benefit low- and middle-income communities across the country.</p>	<p>retail residential bills would be higher under the proposed default retail residential rates. Overall, about 40% of monthly retail residential bills would be between \$1 and \$2 higher, about 30% would be less than \$1 higher, and about 30% would be lower. Figure 11 of the EA presents illustrative residential bill impacts of Alternative C1.</p>
22	Center for Biological Diversity	<p>TVA's false assumptions about the role of DER and its impacts on the grid and other consumers are arbitrary and capricious and violate NEPA. TVA's claim that distributed solar shifts costs from solar to non-solar consumers is erroneous and unsupported. TVA bases much of its 2018 Wholesale Rate Proposal on this "cost-shift" claim by stating that, "TVA's current energy prices over-incentivize consumer installation of DER, leading to uneconomic results for the people of the Valley as a whole . . . The imbalance created by uneconomic DER investment means that costs are shifted to consumers throughout the Valley who do not invest in DER" (See EA, ES at i). However, TVA fails to explain what data it is using to come to the conclusion that TVA's current energy prices lead to cost-shifting. This "cost-shift" argument has been repeatedly discredited. Numerous studies have shown that the benefits of distributed solar equal or exceed costs to the utility and non-solar customers where distributed solar penetration levels remain relatively low. DOE's Lawrence Berkeley National Laboratory has debunked the "cost-shift" argument upon which TVA relies. TVA's argument is further undermined by the fact that jurisdictions with far higher levels of DER penetration are not facing the kind of</p>	<p>TVA has revised the section 1.1 of the EA to clarify cost-shifting and its definition of "uneconomic" DER (see also response to comment 12).</p> <p>TVA's understanding that DER participants shift costs to non-participants is one commonly held within the electric utility industry. TVA cites the work of the National Association of Regulatory Utility Commissioners (NARUC), the national association representing the state public service commissioners; Christensen Associates, a leading consulting firm in the electric industry; and the Edison Electric Institute (EEI), an association which represents all US investor-owned utilities.</p> <p>In response to public comments, TVA added to Section 1.1 of the EA further guidance by NARUC. NARUC's manual addressing Distributed Energy Resources Retail Rate Design and Compensation states that the "economic pressures that DER may put on the utility and non-DER customers within a rate class is one of the most challenging issues facing regulators today." (p. 63) In addition to revenue erosion and cost recovery issues,</p>

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		cost-shift TVA claims to be concerned about.	<p>NARUC cites “inter-class cost shifting apparent in traditional utility rate design” as a major issue (p. 63): “These issues have been driving . . . searches for alternate ways to treat DER in rate making.” (p. 63) The NARUC manual also states that:</p> <p>...under the traditional ratemaking model and commonly used rate design, if the utility passes its relevant threshold of DER adoption, the utility may face significant intra-class cost shifting and erosion of revenue in the short run. If left unaddressed, the utility could face pressures in the long term that might prevent it from recovering its sunk costs, which are necessary to provide adequate service. (NARUC 2016; p. 67)</p> <p>The NARUC Manual closes with the admonition: "Each jurisdiction can start investigating and developing policies that best fit its jurisdiction. Current low adoption rates do not mean that a jurisdiction should wait; in fact, it is a perfect time to start its investigation." (NARUC 2016; p. 158)</p> <p>Christensen Associates, in a January 2015 paper “Pricing Retail Electricity in a Distributed Energy Resources World,” state that "Utilities and state legislatures have begun to address the revenue and cost-shifting problems posed by net metering policies that credit DER at the full retail rate rather than at the avoided cost rate or wholesale market value of electricity.” (p. 10) Christensen states:</p>

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			<p>Part of the threat to the traditional model arises from antiquated retail pricing methods that fail to accurately match the prices and structures of retail power services with the costs and cost causation of those services. The inaccuracies of these old methods have always led to cross-subsidies among electricity consumers; but the cross-subsidies were sustainable only as long as consumers were dependent upon the power grid for virtually all of their power. As distributed energy resources (DER), including distributed generation and demand response, gain larger market shares, however, these cross-subsidies will shift larger and larger shares of costs toward those consumers who do not have their own DER and will incent new forms of uneconomic behavior by consumers, particularly including investment in DER that is expensive relative to other available resources. (Christensen 2015; p. 1)</p> <p>Finally, EEI in the “Primer on Rate Design for Residential Distributed Generation” discusses how costs are incurred to serve residential customers versus how revenues are collected (Edison Electric Institute 2016). In discussing “the difference between the calculated costs of serving a residential customer compared to the way that these costs are recovered by the utility” (p. 2), EEI notes that:</p> <p>It is clear that even though only a fraction of the</p>

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			<p>calculated costs vary with energy consumption, almost the entire amount of revenue is collected based on variable energy consumption charges (\$/kWh). With the recent increases in the amount of residential [DER] installed in most jurisdictions across the U.S., this volumetric rate structure, which is not cost-reflective, is increasingly failing to meet the objectives of good rate design. This failure is exacerbated by the utilization of Net Energy Metering (NEM).(p. 2)</p> <p>EEl notes the problem of such a mismatch:</p> <p>Customer-generators are not paying for grid and customer costs. Customer-generators are being credited not just for the value of the energy they are producing, but also for the grid services that they are consuming, such as use of the transmission and distribution networks to receive and sell electricity. . . . they rely on the grid to smooth out peaks and valleys in their generation profile due to the intermittency of distributed generation. . . . If there is a failure with their [DER] system, they can rely on the grid to meet their full power needs. . . . As a result, the cost of maintaining the grid and customer support services for these customers is borne by other customers who do not have self-generation. (p. 2)</p>
23	Center for Biological Diversity	The notion that mandatory fees are necessary to address cross-subsidies among residential customers ignores the	TVA has not suggested mandatory fees as a way to address retail rate designs or as a manner in which to

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		<p>reality that the entire grid utility system is inevitably riddled with ways in which consumers of electricity are not charged the exact costs for the energy they consume. For example, it is common for utilities to rely on commercial and industrial customers to help subsidize the costs from residential customers – although, as noted, TVA appears to be doing just the opposite here. While utilities have made some effort to address these variations through mechanisms such as Critical Peak Pricing and Time Of Use rates, the fact remains that consumers in all classes are often not paying prices that accurately reflect their costs in all respects. TVA must take these and similar factors into account before deciding whether there is, in fact, a “cost-shift” that could warrant the more than \$1 billion in mandatory fees TVA is proposing.</p>	<p>address cross subsidies. As noted in the EA, TVA has proposed (as Implementing Guidelines to LPCs) default and optional retail rates for LPCs that do not include retail grid access charges for residential consumers. This approach largely maintains the LPCs' current volumetric retail rate structures. Although some other utilities may rely on commercial and industrial customers to subsidize residential customers, TVA does not believe that to be an appropriate aspect of rate design under the TVA Act. Residential consumers of TVA power do get the benefit of low-cost hydroelectric generation, however, which commercial and industrial consumers do not receive. The majority of LPCs currently offer time-of-use rates for residential customers; however, there is almost no subscription to these rates.</p>
24	Center for Biological Diversity	<p>The cost-shift argument fails because TVA does not acknowledge the greater net benefit that distributed solar brings to all consumers, both solar and non-solar, especially when linked to compensation policies like net metering. While TVA does not allow net metering and instead offers a dual-metering program in which TVA buys all the power solar customers generate, extensive studies on compensation policies help affirm the net benefit of distributed solar to the grid overall. (TVA may not base its decision here on a purported “cost-shift” without explaining why such a shift is occurring in TVA’s service territory but not in all these many other jurisdictions – otherwise, its 2018 Rate Change will be patently arbitrary and capricious.)</p>	<p>As noted above, TVA has revised Section 1.1 of the EA to include additional information about cost shifting.</p> <p>See also previous TVA responses addressing cost-shifting. As noted in the response above, TVA’s understanding that DER participants shift costs to non-participants is one commonly accepted within the electric utility industry. See the response to comment 22 addressing the work of NARUC, Christensen Associates, and the Edison Electric Institute.</p> <p>Specifically, NARUC advises "Current low adoption rates do not mean that a jurisdiction should wait; in fact, it is a perfect time to start its investigation." (NARUC 2016; p. 158)</p>

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			NARUC further cautions that “A very important factor in customers’ decisions on DER installation is the price signals sent by the rate design. If those price signals do not appropriately reflect a jurisdiction’s policies on cost-causation, the result will likely be an economically or socially inefficient amount of DER. Waiting too long to set up an appropriate pricing structure can also make grandfathering and equity considerations between future and existing DER customers more of an issue than they otherwise would be.” (NARUC 2016; p. 155)
25	Center for Biological Diversity	TVA’s cost-shift claim also fails because it does not consider the net environmental benefits of distributed solar. If TVA were interested in accurately valuating distributed solar resources so as to have rates representative of actual costs, and to maximize benefits for all ratepayers from increased solar diffusion, the agency would follow the lead of many other rate-making bodies across the country and develop a rate proposal based on a thorough cost-benefit study that includes grid, social, and environmental factors, including but not limited to: avoided adverse impacts on habitat and wildlife, reduced line losses, grid resiliency, job creation, avoided air pollution and GHG emissions, avoided water use and pollution, and the social benefits of access to affordable, customer-owned energy in low-income communities. TVA’s current EA fails to take these factors into account altogether. In short, failing to include a robust cost-benefit analysis of distributed solar in TVA’s EA renders the agency’s reliance on it arbitrary and capricious and	See the previous responses to comments regarding cost shifting. TVA’s experience to date with DER does not support attributing value to DER beyond avoided energy costs. TVA believes that the appropriate way to value solar is based on the marginal cost of the services provided by that generation, as described by Christensen Associates, in a January 2015 paper “Pricing Retail Electricity in a Distributed Energy Resources World” as discussed above. Consequently, the EA notes that the current wholesale rate structure over-incentivizes self-generation, whether renewable or not.

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		contrary NEPA and TVA's own mandates.	
26	Center for Biological Diversity	While TVA claims the 2018 Rate Change is necessary to address DER development that the agency views as too excessive, TVA also claims that the 2018 Rate Change will not influence consumer behavior. Since these two points are mutually inconsistent and contradictory, TVA has not put forward a reasonable basis for the 2018 Rate Change. TVA is required to disclose its actual purpose for the 2018 Rate Change in the EA to allow the public an opportunity to consider and respond to the agency's rationale. Having failed to do so here, the EA is patently deficient.	TVA's purpose and need is articulated in Section 1.1 of the EA. As stated therein, the purpose of the proposed rate change is to refine the structure of its wholesale electric power rates through pricing that better aligns wholesale rates with underlying costs. The proposal is designed to help ensure that DER participants pay their share of system costs rather than shifting them to customers who cannot afford DER or otherwise do not choose to pursue DER. Among TVA's guiding principles of rate design is to provide rate stability and to make changes gradually. TVA's proposed rate change would not noticeably alter generation and usage because it is intentionally designed to be a small, measured change.
III. CONSISTENCY WITH THE TVA ACT AND TVA's MISSION			
27	SACE, J. Adams, V. Alexiades, C. Aronson, D. Ashmore, C. Barber, K. Beaty, N. Beavers, T. Boughan, B. Bowers, S. Brendel, J. Brown-Hall, L. Burch, C. Burch, C & L Burgess, D. Burgess, E. Burgess, T. Burns, H. Burris, K. Carey Jr, T. Case, S. Chamberlin, L. Charles, S. Chilton, D. Clark, J. Clark, J. Conner, G&S Cook, K. Cook, S. Creers, W. Daughterty, J. Deal, E. Denton, V. Dixon, C. Drumright, M. Dryja, D. Dunn, AJ Dwenger, J. Dwenger, T. Echols, T.	The wholesale rate change TVA proposes is in direct contradiction to the spirit of the TVA Act. TVA is ignoring its mission to serve the people of the Tennessee Valley. Among the provisions of the TVA Act of 1933 is the mandate to keep rates as low as possible. TVA's proposed rate structure change contradicts TVA's mission as defined by the TVA Act because it will increase bills of a large number of residential customers in the process of attempting to discourage customer investment in DER resources.	TVA's mission is to provide electricity at the lowest feasible cost, to be stewards of the environment, and to foster and promote economic development. The proposed wholesale rate change is consistent with the TVA mission or the TVA Act (as addressed in greater detail in the response below, response #28). As discussed in Chapter 1 of the EA, TVA is proposing the wholesale rate change to better align TVA's wholesale rates with their underlying costs. The proposed rate structure is intended to reduce upward rate pressure by

#	COMMENTS	COMMENT STATEMENT OR SUMMARY OF STATEMENTS	TVA RESPONSE
	<p>Edwards, B. Everett, K. Ferris, G. Ford, A. Fusco, M. Gingerich, J. Goehl, W. Goehl, B. Grisham, M. Gulick, D. Harris, R. Harris, S. Hawkins, C. Henry, L. Herrmann, C. Hoover, T. Iovino, B. Jenkins, J. Jonakin, J. Jones, T. Jones, B. Knisley, M. Lammers, R. Lamonda, C. Landis, C. Lane, E. Larson, J. Lee, N. Lee, N. Levison, L. Mallory-Elliott, K. Marett, D. Matheny, B. McCabe, J. McCoy, P. McCoy, T. McKnight, L. McKenna, A. Miller, J. Mitchell, B. Morello, P. Morello, D. Neilson, D. Nelson, J. Noble, N. Ottinger, S. Parris, R. Paxton, R. Peeples, S. Peeples, M. Pendergrass, R. Phelps, K. Phillips, M. Poley, W. Rabert, J. Reed, A. Reels, J. Reid, P. Robbennolt, L. Ross, D. Royalty, D&L Rupert, C. Schmidt, J. Settlemeyer, K. Singleton, B. Smith, J. Smith, T. Smith, M. Stanfill, J. Steitz, A. Storic, H. Storic, R. Storic, R. Storic, B. Swinford, D. Thometz, L. Tift, PL Tobey, R. Trahan, E. Turner, M. Vogel, GF Wade, B. Wallace, B. Wallace, R. Westbrooks, G. Whitehead, L. Williams, A. Womac, S. Wyatt, B&A York, S. York, B. Zarnoch, G. Ziegele, and J. Ziegele</p>		<p>mitigating the effects of uneconomic DER development; the structure would also lessen weather-based fluctuations in bills. The intent is to implement changes concurrently, at wholesale and retail and to enhance the fairness of the rate designs for both TVA and LPCs by diminishing cost shifting among consumers and among LPCs.</p> <p>The electric utility industry is facing competitive and technological changes. Those changes will impact the traditional electric utility business model through distributed generation, energy efficiency, technological advances, shifts in customer behavior, and regulatory requirements. This complex interplay of factors creates a need for self-funded electric utilities such as TVA to adjust their pricing structures and their management of generation and transmission assets. Identifying and appropriately apportioning costs of providing electric service is an important factor in equitably addressing this ongoing need. The intent of the proposed rate change is to responsibly and thoughtfully implement the necessary changes to ensure that rates remain as low as feasible for all consumers over time, consistent with TVA's mission to serve and to improve the quality of life in the Valley.</p> <p>The response below addresses the proposal's consistency with specific provisions of the TVA Act.</p>
28	Sierra Club/SELC	TVA's proposed rate change violates at least four provisions of the TVA Act:	First, the commenters assert that section 15d(f) of the TVA Act prohibits TVA from designing wholesale power rates that may cause consumers to pay higher monthly power

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		<p>(1) First, under Section 15d of the TVA Act, the utility is required to establish resale rates in a manner such “that power shall be sold at rates as low as are feasible.” 16 U.S.C.A. § 831n-4. TVA’s own analysis of the rate change, however, demonstrates that the rate change will result in a majority of its residential customers paying a higher rate for electricity than they currently pay. TVA has provided no evidence that the problem it is purportedly trying to address—cost shift from customers who adopt DER to customers who do not adopt DER—is actually occurring or will actually occur in the foreseeable future. In the absence of any such evidence, TVA cannot, consistent with its statutory duty, adopt a rate structure that will raise rates for the majority of the residential customer class.</p> <p>(2) Second, Section 10 of the TVA Act requires TVA, in its sale of electricity, to “give preference to States, counties, municipalities, and cooperative organizations of citizens or farmers, not organized or doing business for profit, but primarily for the purpose of supplying electricity to its own citizens or members.” 16 U.S.C. § 831i. The language in Section 10 makes clear that TVA’s power sales should focus on “farms and small villages,” and on “agricultural and domestic use, or for small or local industries.” Id. Indeed, Section 10 authorizes TVA to “make studies, experiments, and determinations to promote the wider and better use of electric power” among these small and residential customer classes, and to work with States, cities, cooperatives, and other entities to do so. Id. These same customer classes—and the LPCs who serve them—</p>	<p>bills. As described in TVA’s analysis (see Section 1.2.2 Final EA), each alternative has the potential to slightly increase the monthly bill for a majority of residential customers. Section 15d(f) of the Act provides that TVA “shall charge rates for power which will produce gross revenues sufficient to provide funds” for the TVA’s operations and other statutory responsibilities, “having due regard for the primary objectives of the Act, including the objective that power shall be sold at rates as low as are feasible.” This statutory standard requires the TVA Board to exercise its discretion to balance the various objectives of the Act, including selling power at rates as low as feasible. Seeking to improve rate design by having all consumers pay their fair share of the TVA investments from which they benefit is a policy determination well within the Board’s discretion to adopt. Any individual consumer’s power bill depends on many factors besides just the underlying rates. For example, these commenters do not acknowledge the net effect that LPC retail rate elections (such as adoption of the residential hydro benefit allocation flexibility) may have in reducing the overall individual consumer impact of the proposed rate change on any given subset of residential consumers.</p> <p>Second, the commenters assert that TVA’s rate change would “punish” those who invest in DER, contrary to section 10 of the TVA Act. TVA does not seek to punish anyone, but rather is proposing to change how TVA collects its cost in light of a growing number of retail consumers using DER to avoid paying for the grid services from which those consumers still benefit. For example,</p>

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		<p>can benefit from DER by reducing bills and deferring the need for investment in the distribution system. DER can also enhance reliability and resilience for these customers. Yet contrary to its obligations under Section 10, TVA's rate proposal would punish LPCs and customers who invest in DER, who are engaged in promoting the "better use of electric power" in the Valley.</p> <p>(3) Section 12 of the TVA Act requires TVA to ensure through its contracts with distribution utilities that "the electric power shall be sold and distributed to the ultimate consumer without discrimination as between consumers of the same class" 16 U.S.C. § 831k. In the Draft EA, however, TVA proposes that it will develop default retail rate structures for distributors, such as "a declining block rate structure, introduction of a demand charge where one did not previously exist, hours use of demand structure, and a demand ratchet on distribution delivery charges." Draft EA, 13. Although TVA claims these changes are intended to be "revenue neutral," id., TVA's own analysis shows that these rate structures will impose greater burdens on low-use customers and customers with DER. Id. at 24.11 TVA provides no TVA system-specific evidence, however, that low-use customers and customers with DER are causing a cost-shift or imposing greater costs on the TVA system than other customers in their rate class. Accordingly, TVA's own default retail rate proposals would discriminate against low-use residential customers and residential customers with DER, and violate TVA's obligation to ensure that distributors sell electricity to end-use customers "without discrimination as between</p>	<p>consumers with wind or solar DER still utilize the TVA and LPC power systems to power their homes or facilities when the wind is not blowing or the sun is not shining. In tying their argument to section 10 of the TVA Act, commenters overlook the language and historical setting of section 10. Prior to the creation of TVA, rural residents of the Valley largely lacked electric power because the existing for-profit utilities focused their sales on urban areas. Section 10 is largely a rural electrification provision, authorizing TVA to make wider and better use of electric power in underserved rural areas, to allow for better balanced development across the Valley, so that growth is not just focused in large urban areas. Additionally, Section 10 codifies the conventional public power preference for selling power to municipal and cooperative utilities as opposed to for-profit utilities. Thus TVA's proposal to change its rate structure is consistent with section 10.</p> <p>Third, the commenters state that the proposed rate structure discriminates against low-use residential consumers and those who invest in DER, in violation of section 12 of the Act. TVA's proposed rate change promotes a more even-handed (non-discriminatory) collection of each customer's share of TVA's fixed costs and variable costs. Reduced usage, through DER or otherwise, should reduce a consumer's payment for TVA's variable costs (such as fuel not burned), but the consumer should still pay for his or her share of TVA's fixed costs, which still provide valuable service to the consumer through enhanced reliability, load following, standby</p>

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		<p>consumers of the same class.” 16 U.S.C. § 831k.</p> <p>(4) Finally, TVA is required, in its least-cost planning, to “treat demand and supply resources on a consistent and integrated basis.” 16 U.S.C.A. § 831m-1. TVA cannot comply with this requirement in its 2019 IRP if it first imposes an unsubstantiated rate change to burden DER in advance of completing the IRP process. TVA is placing a thumb on the scale of traditional baseload resources before the 2019 IRP even begins to analyze DER. TVA’s approach is the opposite of treating DER on a “consistent and integrated basis” with supply side resources, and is therefore contrary to its obligations under the TVA Act.</p>	<p>service, and supplemental power, among other things. Thus the proposed rate design would actually reduce discrimination among customers by restricting some customers from avoiding paying for their fair share of those fixed costs that provide value to those consumers and which TVA incurred for the benefit of all consumers.</p> <p>Fourth, the commenters state that the proposed rate change will bias TVA’s future integrated resource planning (IRP) in favor of supply-side resources, contrary to 16 U.S.C. § 831m-1, which provides that TVA “treat demand and supply side resources on a consistent and integrated basis” in the “planning and selection process for new energy resources.” The proposed rate change does not involve the planning or selection of new generation sources nor would it bias TVA’s future development of an IRP. Significantly, TVA is not “burdening” DER with additional costs through this rate change. Rather, TVA is proposing a rate design that would put DER on more equal footing with conventional generating resources. Consumers who choose to obtain energy from DER but who continue to rely on the TVA system as described in the previous paragraph should continue to pay for those TVA resources from which they still benefit.</p>
29	Center for Biological Diversity	To the extent TVA’s purpose is to increase consumer reliance on TVA produced electricity, and thus, in the long-term to generate additional revenue, TVA’s 2018 Rate Change is contrary to TVA’s organic statute, which requires that the agency provide “utility rates adequate	See the response above, which addresses consistency with the 16 U.S.C. §831k and §831m-1.

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		<p>and reliable service to electric customers of the Tennessee Valley Authority at the lowest system cost.” 16 U.S.C. § 831m-1(b)(1) (emphasis added). Since it is evident that consumers can obtain the lowest cost through the very energy conservation measures and DER adoption which the 2018 Rate Change will thwart, the proposal is arbitrary and capricious because it is contrary to TVA’s statutory mandates.</p> <p>This also further reveals how the 2018 Rate Change proposal is contrary to TVA’s overarching mandate to provide “reasonable, just, and fair” electricity rates. 16 U.S.C. § 831k. Relying on residential customer to subsidize commercial customers, and then further exacerbating that inequity by relying on DER customers and lower income customers who use less electricity to subsidize the rest of TVA’s residential customers is the antithesis of reasonable, just, or fair.</p>	
30	SACE	<p>TVA is inconsistent with the TVA Act because it fails to identify the effect of its strategic pricing plan on cost-shifting to residential customers and implementation of mandatory fees at the LPC level.</p>	<p>The commenter provides extensive comments about past rate change proposals implemented by TVA and states that the proposals favored industrial customers over residential customers, in violation of the TVA Act. These comments refer to previous TVA decisions and their supporting environmental reviews rather than to TVA’s proposed actions, which are the subject of this environmental analysis. In the previous environmental reviews, TVA provided an analysis that included its best estimate of the potential impacts of the action proposed at that time. See also TVA’s response to comments that TVA is unfairly favoring industrial customers (response 5).</p>

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31	SACE	The proposal is inconsistent with the TVA Act because TVA's previous rate decisions have resulted in significant decreases in rates for industrial customers and steady rate increases for residential customers	The comments regarding the previous rate change decisions by TVA do not clearly relate to the draft EA or to TVA's consideration of the current proposed rate change. Please see TVA responses to comments that TVA is unfairly favoring industrial customers (response #5) and to responses relating to TVA's compliance with the TVA Act (responses #27 and 28).
32	SACE	The proposal is inconsistent with the TVA Act because TVA's preferred alternative is not in the best interest of LPCs.	TVA continues to work closely with LPCs. TVA's preferred alternative in the Final EA reduces the wholesale energy rate by 0.5 cents per kWh, which is a lower wholesale grid access charge than previously proposed. This reduction was, partially in response to concerns raised by LPCs.
33	Memphis AARP Branch, Tennessee State Conference NAACP Environmental Justice Committee, Herman Morris	We believe that any rate change to create new fixed fees, like TVA's Grid Access Charge (GAC), or increase current fixed fees, like those used by LPCs to recoup costs associated with past TVA rate changes, would be inconsistent with the purpose of TVA and its duty to provide lowest-cost power to residential customers.	Fixed charges currently billed to residential consumers by local power companies are customer charges designed by the local power companies to recover distribution costs. Customer charges do not recover the local power companies' cost of power purchased from TVA. Sending clear pricing signals that reflect the value of the grid and the fixed costs associated with operating it will allow TVA to continue to provide power at the lowest feasible cost, consistent with the mandates of the TVA Act.
IV. TVA'S INTEGRATED RESOURCE PLAN			
34	Sierra Club/SELC	In short, there are at least two steps that must be completed before TVA can take a proper hard look at the purpose, need, and impacts of such a dramatic shift in its rate structure as is discussed in the Draft EA: (1) Valley-wide distribution resource planning; and	TVA conducts integrated resource planning to meet future power demand by identifying the need for generating capacity and determining the best mix of resources to meet the need on a least-cost, system-wide basis. Integrated resource planning results in TVA selecting a

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		<p>(2) A generation and transmission-oriented integrated resource plan that incorporates the results of distribution resource planning.</p> <p>Distribution-level planning should occur first, followed by TVA planning, and lastly, a conversation about any potential changes to the rate structure. TVA should allow ongoing and necessary processes to be completed first, before it seeks to change rates in a premature and uninformed process as it now proposes.</p>	<p>power supply mix that meets the future power demand. In contrast, TVA's rate restructuring proposal is not a supply-side proposal, but rather a proposal to better align wholesale rates with the underlying costs to provide service under the existing generation portfolio. The proposed rate action would not alter TVA's current generation portfolio. Any action taken by TVA with respect to the rate restructuring proposal would not influence TVA's ultimate decision in selecting a target supply mix for the 2019 IRP. Accordingly, any decision on the rate change proposal may be taken even while work on the 2019 IRP is in progress.</p> <p>TVA does not believe that it is necessary to conduct an integrated resource planning process prior to implementing its proposed rate change. As the EA shows, the effects of the proposed rate action would be minor and would not alter TVA's current power generation portfolio. TVA found that the rate change would have negligible effects on TVA's forecast for energy production and that the rate change would have only a marginal impact on DER adoption in the Valley.</p>
35	Sierra Club/SELC	TVA appears to ignore the results of its own prior IRP process. TVA notes in the Draft EA that, under its preferred alternative, DER adoption would likely slow. Although TVA frequently calls DER "uneconomic," the reality is that TVA's 2015 IRP and accompanying EIS found that the IRP strategy that maximized energy efficiency was the only strategy with a net positive	As noted above, TVA has revised the EA to clarify its use of the term "uneconomic" when describing certain DER installations (section 1.1.). TVA considers DER to be "uneconomic" when the cost of energy derived from the DER is greater than the cost of the energy if provided by the local power company or directly by TVA. Due to the nature of the current rate design, installations may be

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		economic impact, based on in-Valley jobs created.	“economic” for the individual or company that installs them but may be “uneconomic” for the Valley or other ratepayers. Under the current rate structure, an individual consumer’s savings in energy costs would be the retail cost of the energy, less the cost of the installed DER. However, the LPCs’ and TVA’s savings attributable to the DER would be generally limited to the fuel cost that would have been incurred to supply the energy from TVA generation. The system as a whole would lose more revenue than it saves in costs and overall rates would rise. TVA utility-scale solar installations are a substantially lower cost resource to serve Valley energy needs than smaller, local installations, which benefit their purchasers at the expense of other Valley electric consumers. Consequently, small-scale installations are not ideal from a societal economics perspective and are referred to as “uneconomic.”
36	Sierra Club/SELC	Although the 2015 IRP did not examine DER as a resource generally, it did evaluate a strategy that would have maximized energy efficiency. TVA found that maximizing energy efficiency would have not only the most positive employment impacts but that it would have fewer environmental impacts than the reference plan. To the extent TVA intends to tier from the 2015 IRP EIS, it should discuss these findings in the EA and how they apply to the no-action and grid charge alternatives, rather than ignore this prior analysis.	TVA has revised its EA to clarify the relevance of the 2015 IRP and its EIS analysis. TVA primarily relies on the 2015 EIS for affected environment information when describing relevant resources and incorporates by reference this information in sections of the EA. The EA itself provides a concise review of potential impacts associated with this proposed rate action and, thus, TVA does not incorporate analyses of the various planning strategies from the IRP.
37	Sierra Club/SELC	The Draft EA improperly tiers to the 2015 IRP EIS. The Draft EA purports to tier to TVA’s 2015 IRP and accompanying Environmental Impact Statement (“EIS”). However, TVA has publicly acknowledged that the 2015	TVA has revised section 1.3 of the EA to clarify the relevance of previous environmental reviews. Statements in section 3.5 relating to air resources and the 2015 EIS were also revised. As noted in the EA, TVA primarily relies

#	COMMENTS	COMMENT STATEMENT OR SUMMARY OF STATEMENTS	TVA RESPONSE
		IRP and EIS need to be updated and has begun the scoping process. It is arbitrary to tier to an EIS that TVA itself has acknowledged is outdated and for which the agency has begun a scoping process for a new EIS. TVA should complete NEPA analysis of any proposed rate change concerning DER only after and in the context of the 2019 IRP and distribution utility planning.	on the affected environment information in the 2015 IRP EIS when describing the relevant resources.
38	SACE	<p>TVA's Draft 2018 Rate EA improperly tiers off previous TVA NEPA documents: TVA misleadingly claims its proposed rate and structure change "tiers" from its 2011 IRP Environmental Impact Statement and subsequent Supplemental Environmental Impact Statement (SEIS) for its 2015 IRP.</p> <p>...The Draft 2018 Rate EA does not indicate how it is linked to prior IRP documents. TVA does not specify which scenario(s), nor which strategy(ies), from the 2015 IRP are relied upon for its analysis in the Draft 2018 Rate EA.</p>	TVA has revised section 1.3 of the EA to clarify the relevance of previous environmental reviews. Statements in section 3.5 relating to air resources and the 2015 EIS were also modified to avoid confusion. As noted in the EA, TVA primarily relies on the affected environment information in the 2015 IRP EIS when describing the relevant resources. As to the potential impacts of the proposed rate change action, the EA itself provides a concise description of those impacts.
39	Center for Biological Diversity	TVA cannot proceed with its rate change at this time, and ignore these impacts, on the grounds that such analysis will be covered by an IRP. TVA may not avoid these NEPA duties by claiming that the missing impacts analysis is more suitably handled in the context of the IRP process. See EA at 39 (claiming any environmental impacts to air pollution or greenhouse gas emissions from the 2018 Rate Change was addressed in the 2015 IRP). The 2015 IRP expressly excluded DER as a "resource acquisition issue outside the scope of the IRP." Accordingly, there is absolutely no basis on which TVA could "tier" to the 2015 IRP in addressing environmental impacts associated with	As noted above, TVA has revised section 1.3 of the EA to clarify the relevance of previous environmental reviews and statements in section 3.5 relating to air resources and the 2015 EIS were also modified. The potential impacts of the proposed rate change action are described in this EA itself.

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		<p>rate changes that will impact the development of DER in TVA's service territory. Rather, those impacts must be addressed in the NEPA analysis over the 2018 Rate Change itself.</p> <p>Alternatively – and even more appropriately – TVA may address these environmental impact issues in its 2019 IRP and associated EIS, the process for which has just recently begun. Indeed, the new IRP is slated to address many of the environmental issues discussed above, including the availability and use of DER. Thus, TVA should consider these environmental impacts associated with the proposed rate change in the NEPA process that will be undertaken in connection with the 2019 IRP.</p>	
V. RANGE OF ALTERNATIVES			
40	SACE	<p>The Draft 2018 Rate EA appears to support alternative other than Preferred Alternative (Alternative C): One key way that TVA obscures its intent to reduce customer investment in DERs is by focusing on Alternative C, a 1 cent per kWh shift from the energy charge to the GAC, and identifying it as its preferred alternative. However, as documented in a number of TVA presentations made in 2017, TVA expects its wholesale pricing structure to have a “trajectory” towards a shift of 2.5 cents per kWh, which is more similar to Alternative D. TVA is engaging in a disingenuous, and ultimately useless, NEPA process if it misrepresents or misidentifies its preferred alternative in the Draft 2018 Rate EA. It appears most likely that TVA intends to use the Draft 2018 Rate EA as a basis for pursuing Alternative C in the short term, but Alternative D</p>	<p>TVA noted in its draft EA that its preferred alternative was Alternative C because the alternative was proposed as its rate change to LPCs in the August 2017 Rate Change Letter. The commenter is correct in noting that TVA found that Alternative C and D would have similar impacts. As noted previously, TVA added Alternative C1 to the EA and identified it as the preferred alternative.</p> <p>TVA is not proposing to implement any additional rate changes other than the action analyzed in the EA. While no specific future proposals are under consideration at this time, TVA addresses the potential for additional rate changes in the future in its discussion of cumulative impacts in the EA (section 3.10) because additional rate changes addressing cost recovery are reasonably</p>

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		<p>in the long term. In Table 1 of the Draft 2018 Rate EA, TVA summarizes the impacts of Alternative D using the exact same words as Alternative C - suggesting that a GAC that is 2.5 times that of Alternative C has exactly the same impact. It is easy to imagine members of the TVA Board being told that while this Draft 2018 Rate EA indicated Alternative C as its preferred alternative, the record also supports Alternative D and no further NEPA review is required.</p>	<p>foreseeable.</p> <p>As stated in section 3.10, should TVA implement additional rate changes in the future, the cumulative impacts of those changes may resemble the impacts analyzed in the review of Alternative D, which would implement a much greater fixed cost recovery than other alternatives and result in the greatest grid access charge and corresponding energy rate decrease. TVA found very minor economic effects associated with implementation of Alternative D and found that there would be no or indiscernible environmental impacts.</p>
41	SACE	<p>TVA failed to consider all reasonable alternatives in the Draft EA, including:</p> <ul style="list-style-type: none"> - An alternative that would roll back rate preferences for industrial customers, which would be beneficial to residential customers; - An alternative in which it encourages DER adoption by large consumers. Analysis would be most appropriately completed during the resource planning process, with implementation through a rate structure change. TVA is justifying its rate change by an assumption that increased investment in DERs by its customers will increase system costs, but provides zero evidence to back up this claim. In a recent study, Lawrence Berkeley National Lab explored factors that drive retirement of power generation by region, and found that low load growth (particularly load contraction) and high reserve margins tend to have strong relationships with high retirements in a region. If DERs do 	<p>As stated in Section 1.1 of the EA, the primary objectives of the proposed rate change are to better align wholesale rates with their underlying costs to serve and to facilitate measured, managed change for retail customers.</p> <p>Consideration of alternatives that encourage DER adoption and expansion would exacerbate the underlying cost-shifting and fairness issues TVA is seeking to address and thus, does not meet the underlying purpose and need for TVA's proposal. TVA's proposal seeks to ensure equitable distribution of costs and, as described in Section 3.3.2 of the EA, TVA describes the potential negative impacts to its customers, including low-income households, if no action is taken to improve alignment of TVA's wholesale rates with their underlying costs.</p>

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		<p>reduce load growth, as TVA infers in their Draft 2018 Rate EA, DER's would allow TVA to retire older, inefficient conventional power generation and thus reduce its cost to serve; and</p> <p>- An alternative in which it encourages residential DER adoption. Analysis would be most appropriately completed during the resource planning process, with implementation through a rate structure change. TVA has not made the case that residential DER adoption, including energy efficiency and rooftop solar, would result in a less cost-effective and reliable service.</p>	<p>See also the previous TVA responses to comments regarding TVA's underlying purpose and need and to comments that TVA's rate structure favors industrial customers (response to comment 5).</p>
42	SACE	<p>Alternatives to the GAC: There are a number of issues that TVA's rate change proposal does not address, including electric vehicle program development, other storage DERs, and fuel swapping. TVA's Draft 2018 Rate EA should also include discussion of the alternative approaches to the specific GAC TVA evaluated and presented to TVPPA during Strategic Pricing Plan discussions. TVA evaluated at least five other wholesale rate alternatives that did not include a GAC, which is referred to in this table as a "competitive transition charge." At least one of these was heavily favored by a number of LPCs.</p> <p>TVA also appears to have considered a number of retail rate structure design alternatives to the declining block rate discussed in the Draft 2018 Rate EA. TVA appears to have postponed the development of "default rates" until after the wholesale rate structure issue is resolved. However, there is no language in the Draft 2018 Rate EA</p>	<p>TVA has not proposed program development such as those associated with electric vehicles, pilot programs for new technologies as part of this rate change. TVA's proposal is intended to align its rates with the underlying costs. Addressing programs such as these would not address the underlying need for the proposal and thus, was not considered in the EA's alternatives.</p> <p>TVA, TVPPA, and TVIC discussed various methods of effecting improved alignment of wholesale rates with their underlying costs to serve during the rate change negotiations. Some methods failed to accomplish improved alignment, while others resulted in unacceptably high wholesale bill impacts.</p> <p>TVA and TVPPA discussed several approaches to implementing the wholesale standard service rate change in retail rates. Some methods resulted in unacceptable high retail bill impacts, while others resulted in overly</p>

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		<p>committing TVA to bringing forward the default rate structure or any other policy changes that may be made following its decision on the GAC.</p> <p>Beyond programs and rate design alternatives that were not considered, TVA also did not consider generation-based changes such as retirements, reduction of reserve margins, or potentially transmission-based solutions that would reduce overall operating and fixed costs for the system as a whole.</p>	<p>complex billing implementations. As state in the EA, LPCs would not be obliged to implement either the proposed default or optional retail rates but may elect to implement their own rate designs, subject to the TVA Board-approved retail rate review process. The description of the proposed default retail rates and the proposed optional retail rates, as well as proposed guidelines for customized LPC retail rates may be found in EA 2.3.1.</p> <p>Generation-based changes such as "retirements, reduction of reserve margins, or potentially transmission-based solutions" are not properly included in rate design. TVA conducts integrated resource planning to consider future power demand by identifying the need for generating capacity and determining the best mix of resources to meet the need on a least-cost, system-wide basis.</p>
43	TenneSEIA	<p>TVA also did not consider generation-based changes such as retirements, reduction of reserve margins, or potentially transmission-based solutions that would reduce overall operating and fixed costs for the system as a whole. More significant, long-term structural changes that have not been evaluated include allowing LPC's to procure or acquire DER resources.</p>	<p>See TVA's previous response (#42). TVA also notes that it has reduced its annual operating costs by more than \$800 million in recent years and continues to seek efficiencies and reductions that ensure its costs are minimized.</p>

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44	M. Walton	<p>Rate Design Recommendation #1: Rate design for Green Power Providers and other renewable energy programs should take into account the long-term availability of fuel sources and long-term costs for their waste streams. A supply constriction of a resource that has high global demand could cause fuel costs to sky rocket. Failure to store waste in responsible ways also increases the risk of large economic penalties. The value of renewable resources is only affected by temporary intermittency that can be resolved with distributed and central energy storage and they have no similar large scale risk for the storage of waste.</p> <p>Regarding rate design, it should be made possible for an aggregated group of smaller customers that can leverage sufficient distributed generation and distributed storage resources, such that the load profile of that aggregate could match the load profile of a large BCD customer, to have the same rate schedule as those BCD customers.</p>	<p>Comment noted. The proposal under consideration is not specific to Green Power Providers or renewable energy programs. TVA considers fuel sources and costs when preparing its Integrated Resource Plan.</p> <p>TVA rates must be nondiscriminatory. That means that customers with similar characteristics must be billed at the same rates. Aggregating residential customers or small commercial consumers would not result in a load profile similar to a large general service or large manufacturing customer; total kWh might be equal, but times of usage and voltage of delivery would be quite different from that of a large customer. Rates for BCD customers were designed for commercial and manufacturing customers.</p>
45	Center for Biological Diversity	<p>Failure to consider a reasonable range of alternatives: Since the stated purpose of the 2018 Rate Change is to impact the adoption of DER, TVA must consider a reasonable range of alternatives regarding the rates of DER adoption in TVA service territory. TVA must consider alternatives that will encourage adoption and expansion of DER development so that it is more commensurate with the development of DER in other areas of the country.</p> <p>TVA must also consider alternative means to address the needs of low-income consumers that take into account the</p>	<p>As stated in Section 1.1 of the EA, the primary objectives of the proposed rate change are to better align wholesale rates with their underlying costs to serve and to facilitate measured, managed change for retail customers. Consideration of alternatives that encourage DER adoption and expansion would exacerbate the underlying cost-shifting and fairness issues TVA is seeking to address and thus, does not meet the underlying purpose and need for TVA's proposal.</p> <p>Likewise, as noted in the previous TVA response,</p>

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		adverse impacts of the proposed mandatory fees on such communities. If TVA wants to show concern for low-income populations as the EA purports, the agency should consider alternatives that incorporate guidelines developed by groups such as NAACP and GRID Alternatives, which outline policies that help increase access to distributed solar for low- and middle-income communities.	alternatives that are intended specifically to address the needs of low-income consumers would not meet the underlying need, or TVA's mandate to apply rates fairly. TVA rates must be nondiscriminatory, which means that customers with similar characteristics must be billed at the same rates. TVA's proposal seeks to ensure equitable distribution of costs and, as described in Section 3.3.2 of the EA, TVA describes the potential negative impacts to its customers, including low-income households, if no action is taken to improve pricing of TVA's wholesale rates with their underlying costs. See also the previous responses to comments regarding TVA's underlying purpose and need.
46	Sierra Club/SELC	TVA's extremely narrow range of alternatives fails to consider differences between customer locations. Although TVA characterizes the new, flat charge it proposes to make up for its proposed decrease in volumetric pricing as a "grid access charge," TVA does not consider any alternatives designed to accurately assess what grid access might be for different types of customers. As noted below, grid access costs for residential customers are generally extremely nominal, but there are ranges that TVA should evaluate if indeed its fixed charge is intended to genuinely address the cost of accessing the grid.	The wholesale power contract between TVA and its local power companies prohibits special waivers or considerations for certain customers within the rate class. It states, "the power purchased hereunder shall be sold and distributed to the ultimate consumer without discrimination among consumers of the same class, and that no discriminatory rate, rebate, or other special concession will be made or given to any consumer, directly or indirectly." Alternatives such as those addressing economical energy use, energy efficient appliances, impoverished consumers with low usage, or location would result in discrimination in favor of some consumers and against the LPCs' other electric consumers.
47	Sierra Club/SELC	The Draft EA's alternatives analysis is improperly narrow. Other alternatives would be more reasonable because they would be more consistent with generally-accepted	Although TVA has fully supported "smart rate designs," retail customer participation has not materialized. Currently, all 154 LPCs and all of the 750 large customers

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		principles of smart rate design. Such alternatives include things like locational pricing, which provides incentives for DER that can be located in areas to reduce system congestion, thereby obviating potentially costly system upgrades that TVA would have to recover from its customers. Smart rates, such as time of use, critical peak pricing, and real-time pricing, should also be included in the body of reasonable alternatives TVA must analyze, as they could also address potential challenges TVA might perceive in integrating increasing amounts of DER into the TVA system.	are served under a time of use rate structure. In addition, LPCs have requested and TVA has approved residential and small general service retail time of use rate designs for approximately 80 LPCs over the last ten years. Unfortunately, retail customers have demonstrated little to no interest in participating; subscription is less than 0.41%. In addition, TVA has developed methodologies to translate the wholesale grid access charge to those time of use retail rate designs. TVA has offered real-time pricing to large customers for over ten years; after more than ten years, subscription is almost zero. TVA currently supports LPCs offering demand response programs; however, participation is minimal. These methods do not constitute reasonable alternatives to the proposed rate change action whose purpose is to align wholesale rates with underlying costs.
48	G. Miller, M. Magallanes, J. Vance, T. Edwards	<p>Comments were submitted suggesting that TVA raise (adjust) its rates to generate additional revenue, rather than apply a grid access charge. Comment statements include the following:</p> <ul style="list-style-type: none">- TVA should raise rates to generate additional revenue rather than apply a GAC. If TVA wants to generate additional revenue, and such increased revenue is essential for continued operation, then the most reasonable plan would be to simply raise the rates charged for consumption of each kilowatt ... a fair plan based on actual usage.-I feel that additional revenue should be sourced from rate increases (if it's needed at all). This would incentivize consumers to reduce power usage and seek out more	<p>In the EA, TVA makes clear that it has not proposed the rate change in order to generate additional revenue. The proposed rate change would not raise additional revenue. A rate change is the process by which TVA changes the structure of the rates or the allocation of costs. Rate changes are designed to continue to provide the same amount of revenue to TVA.</p> <p>The purpose of the proposed rate change is not to increase rates or generate additional revenue, but to ensure that rates remain as low as feasible in the Valley. One of the goals is to improve the alignment of wholesale rates with their underlying costs to provide that service. The retail price of a kWh of electricity is not simply the cost to generate that energy. Residential rates and most small consumer rates are primarily volumetric, meaning the bill</p>

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		<p>efficient appliances and other electric goods.</p> <p>- It is my understanding that there is a proposal for a new Grid Access Charge in order to generate additional revenue. From my standpoint this should be built into the price of electricity so that pricing can be regulated. The government grants monopoly power to some entities such as the power company.</p>	<p>varies based solely on the quantity of kWh consumed each month. Consequently, the costs for generation, transmission, and distribution are included in retail cost per kWh.</p> <p>When a customer saves one kWh, TVA and the local power company save the portion of generation costs related to fuel, but the non-fuel generation costs, the transmission costs, and the distribution costs are not reduced. With this proposed rate change, a small portion of the non-fuel generation costs and transmission costs would be recovered at wholesale based on a fixed monthly charge rather than all on a volumetric basis. The goals of the proposed rate change include reducing upward rate pressure and improving price signals to consumers.</p>
49	Southern Current (Hamilton Davis)	<p>TVA failed to consider and assess alternative rate structures that are capable of sending more accurate price signals to customers while enhancing consumer choice rather than limiting it. TVA should conduct an additional rate design analysis that considers other rate options that can more effectively send price signals to customers without needlessly constraining consumer options. We agree that stronger price signals should be sent to consumers, however, we disagree that simply increasing fixed charges is an appropriate way to accomplish this goal. Increased fixed charges reduce a customer's ability to adjust usage patterns and total consumption in ways that are economically and environmentally beneficial to all rate payers. Adopting rate structures that reward smarter energy use should be evaluated as an alternative to higher</p>	<p>TVA modeled approximately 15 wholesale rate designs and shared those results with TVPPA representatives. Alternative designs included a contract demand charge, declining block wholesale structures, and coincident peak designs. The design proposed in the 2018 rate change was chosen by TVA and TVPPA because there was consensus that it would result in the least impact to LPCs and their retail customers and it would not require capital investments by LPCs (and therefore higher costs to retail customers). TVA has developed proposed default retail rates that would minimize impacts to retail customers. In addition, TVA is the rate regulator for nearly all LPCs and would act to minimize bill impacts to retail customers.</p> <p>TVA disagrees that the wholesale and retail rate designs</p>

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		fixed charges, which function to preserve the status quo and discourage the environmental and socio-economic advantages that come with innovation.	would remove incentives for customers to adjust usage patterns in ways that are economically and environmentally beneficial to all customers. The proposed default rates and the proposed optional retail rates would provide essentially the same degree of incentive to adjust patterns and consumption as the current rate structures do.
50	State of Tennessee Department of Environment and Conservation	The State of Tennessee receives numerous utility bills that would fall under Part A of the Outdoor Lighting Rate Schedule noted in 2.1.3 “Other Matters” on page 11. Other than in this section, this topic is not covered anywhere else within the document. TDEC recommends that TVA explain in greater detail how Alternatives B, C, and D will impact these non-metered, flat rate fee schedules.	If the proposed rate change is implemented, TVA anticipates that outdoor lighting rates would increase by approximately 0.3 percent. The small proposed increase in outdoor lighting rates is attributable to the increase in Standard Service rates required to maintain the revenue neutrality of the rate change proposal to decrease large general service rates by 8 percent. No changes are proposed to the structure of Part A of the Outdoor Lighting Schedule.
51	State of Tennessee Department of Environment and Conservation	TDEC recommends clarify process of implementing guidelines with LPCs. Under 2.3.1 “Implementing Guidelines” on page 13, TVA’s Role in the Power Service Area, TVA states that “In lieu of implementing either the default retail rates or the optional retail rates described above, LPCs would be able to propose their own rate structures and retail rate designs, subject to the retail rate review process established by the TVA Board in August 2014.” However, no timeframe is provided for LPC’s to propose their rate structure. Would those be presented in a public forum and/or be open to public comment? Additionally, there are over 150 LPCs throughout TVA’s service area. Do LPC rate structure decisions and processes work similarly for each LPC?	<p>TVA would work with individual LPCs to determine their timeframe for implementing revised rates. No changes associated with this rate proposal would take place prior to October 1, 2018. TVA anticipates that the timeframes would vary widely among LPCs. LPCs would have the option to defer implementation of the wholesale standard service grid access charge until October 1, 2019. Thus, changes may be spread over this period across the TVA service area. TVA revised its description of Alternative C1 (section 2.3 of the EA) with this clarifying information.</p> <p>Municipal LPC rate actions would be reviewed in each locality before the governing body, while cooperative LPCs would handle their rate actions in accordance with state</p>

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			law and each cooperative's charter. Over time, individual LPCs have developed customized rates that best reflect the needs of their system and customers. Thus, there is great variability among rate structures throughout the TVA service area.
52	Appalachian Voices	Under no scenario is increasing electric rates "more beneficial for low-income households." If TVA customers are requesting bill stability, there are better alternatives than those examined in the EA. Rather than implementing a Rate Change that would reverse energy efficiency and renewable energy gains across the Tennessee Valley, and negatively and disproportionately impact low-income, minority and elderly and disabled households, TVA should consider alternative rate designs and implement complementary programs that achieve the goal of cost recovery while also benefitting, rather than harming, these socioeconomic classes, and that encourage the growth of renewable energy and investments in energy efficiency.	Bill stability is described in the EA as a potential impact of TVA's proposal and is considered to be a secondary benefit, not a critical objective of the proposal. Stability has long been recognized as a principle of good rate design (Bonbright, 1961). As described in the response to comment #2, incentives remain for energy efficiency and renewable energy installations. The rate change proposal does not increase revenue for TVA. Indeed, the increase to wholesale standard service rates (which includes power provided for residential customers) is only 0.3%. As described in the response to comments #10, 11, and 12, the proposed rate change will help relieve those customers who cannot afford DER from having to subsidize those who invest in DER.
VI. SOCIOECONOMIC ANALYSIS			

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53	C. Barber, P. Slentz, M. Walton, Memphis AARP Branch, Tennessee State Conference NAACP Environmental Justice Committee, Herman Morris	<p>Commenters oppose the proposed rate change because low income consumers would be disproportionately harmed.</p> <p>The proposal's disincentive for efficiency impacts low-income rate payers more heavily because the fixed cost is a larger percentage of their total monthly income and programs that rely on potential savings such as on-bill financing and on-meter tariffs are less effective if potential savings are reduced.</p> <p>TVA could work with THDA to help implement state-wide Percentage of Income Payment Plans that LPCs could opt into. This would achieve a similar result of moving to fixed payments from variable payments for a large percentage of TVA's residential customer base but would protect the most vulnerable customers from the potential unintended consequences of the rate design change.</p>	<p>TVA is proposing a grid access charge at the wholesale level. Residential customers in the Valley already have bills based on a combination of fixed monthly fees and volumetric energy charges. Their bills would change only slightly as a result of the proposed alternative. The small changes in retail bills would only slightly change incentives for energy efficiency.</p> <p>In the EA (section 3.3), TVA has clarified its statements about the benefits of bill stability to low-income households. TVA's intent was to note that more stability is beneficial compared to less stability, all else equal, and that low-income households are likely to benefit more from additional stability than other households.</p> <p>TVA has also added information in the EA regarding the potential impacts on low-income customers. Because low-income customers can be low, moderate, or high energy users, some would have small increases in bills (up to about \$2 per month) and some would have small decreases. The change in bills is related to energy use, not income status.</p> <p>TVA's rates are low compared to the U.S. as a whole (see Appendix B and https://www.tva.com/Newsroom/How-TVA-Helps-Keep-Your-Power-Bill-Low). TVA recognizes that any increases would be more as a proportion of income for low-income households, and that some low-income households may be burdened by the proposed</p>

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			<p>alternative. TVA's proposal includes Implementing Guidelines for LPCs to ensure that economic impacts to consumers at the retail level are gradual and minimized.</p> <p>TVA does not implement payment plans for individuals because TVA sells power at wholesale to the LPCs. Such payment programs would be more appropriately implemented by the LPCs that serve those individuals.</p>
54	Memphis AARP Branch, Tennessee State Conference NAACP Environmental Justice Committee, Herman Morris	<p>Conflicting Analysis: TVA continually contradicts itself when categorizing potential negative effects on minority or lower-income residential customers as alternately uncertain or conclusively negligible. For example, TVA first claims, "no particular minority or other socioeconomic group would bear a disproportionate share of negative effects." Later in the document, TVA admits, however, that "the potential impacts of (its preferred Alternative) Alternative C to [LPC] customers is difficult to assess precisely." Yet, TVA goes on to admit, "each alternative has the potential to slightly increase the monthly bill for a majority of residential customers." In fact, TVA claims residential customers who have a high usage would see a decrease in their average monthly bills, while low-usage households would see increases in average monthly bills. Taken together, these statements show that even while claiming that any impact would be insignificant, TVA has not done the appropriate analysis to determine actual impacts to residential customer bills.</p>	<p>TVA does not believe that these conclusions are contradictory. It is true that potential impacts have some uncertainty, because the impacts depend on the interaction of TVA's proposed alternative and future decisions of LPCs and their customers, as well as other market forces. However, TVA has analyzed the expected impacts based on the available information.</p> <p>The conclusion that impacts would not be significant under NEPA is based on TVA's analysis that changes to bills would be relatively small, up to \$2 per month. Because this analysis has some uncertainty does not mean that conclusions based on the analysis are contradictory.</p> <p>That said, TVA has added details to its analysis of impacts in the final EA.</p>
55	Herman Morris	TVA has cleverly talked around the devastating impact its EA will have on the part of the population in the city of Memphis, and the MLGW customer base, most vulnerable	TVA has added additional information into the EA regarding the potential impacts to low-income and minority households (section 3.3). Low-income households include

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		<p>to such unfair rate hikes, the part of the population that is Black and poor. According to "The 2017 Update of the Memphis Poverty Fact Sheet, Produced Annually by Dr. Elena Delavega of the Department of Social Work at the University of Memphis. Data from the 2016 American Community Survey Released in September 2017." "The city of Memphis has a poverty rate of 26.9%. Child poverty is 44.7%, The City of Memphis poverty rate for Blacks is 32.3% . " TVA's own language, is not that difficult for the average poor and Black MLGW customer to decode. "uncertain or conclusively negligible," "no particular minority or other socioeconomic group" "bearing a disproportionate share of negative effects." And "the potential impacts of (its preferred Alternative) Alternative C to [LPC] customers are difficult to assess precisely." Yet, TVA goes on to admit that "each alternative has the potential to slightly increase the monthly bill for a majority of residential customers." Their life experiences show that that they are the group who are below the poverty line the negligible ripple to which TVA refers hit like a tsunami just as the storms the knock out their power does. And this impact is not difficult for these Black and poor MLGW customers to assess.</p>	<p>low use, moderate use, and high use energy users. As explained in the EA, some low-income households would have an increase in some monthly bills and some would have a decrease in some monthly bills, depending on their energy use.</p> <p>Bill stability over time is expected to be a benefit to low income households. This is not intended to convey that bill stability would necessarily offset any negative impacts of bill increases, only that it is a benefit relative to an environment of less bill stability. This has been clarified in the EA.</p> <p>As noted above, TVA's rates are low compared to the U.S. as a whole (see Appendix B and https://www.tva.com/Newsroom/How-TVA-Helps-Keep-Your-Power-Bill-Low). TVA notes that MLGW's residential rates are among the lowest in the TVA service area.</p> <p>The maximum expected increase in bills would be \$24 per year under Alternative C1, C2, and D. TVA recognizes that this would be a burden to some low-income households. TVA has concluded that any negative impacts resulting from the proposed alternative are not significant under NEPA.</p>

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56	Memphis AARP Branch, Tennessee State Conference NAACP Environmental Justice Committee, Herman Morris	"With regard to impacts on low- and moderate-income households, TVA ignores the fact that low-income homes are likely to use less electricity on average than higher-income homes, arguing a duplicity that "[l]ow-usage households ' monthly bills would increase more than other households as a proportion of household income" "while also claiming that "Alternatives C and D would ...be more beneficial for low-income households, for whom variations in bills due to season or weather are more likely to cause a problem than for other households." Under no scenario is increasing electric rates "more beneficial for low-income households."	As noted above, TVA has revised its socioeconomic discussion in section 3.3 of the EA to address energy use and burden on low-income households. TVA has also clarified its statement regarding bill stabilization. See also the response to the previous comment.
57	Memphis AARP Branch, Tennessee State Conference NAACP Environmental Justice Committee, Herman Morris	In terms of solar penetration levels, nowhere in the draft EA does TVA conduct or provide any quantitative analysis of investment in solar by residential customers to justify its concern. Instead, TVA weaves a narrative of how low-income customers across the Valley will be forced to subsidize higher-income residential and commercial customers investment in solar without providing any analysis or proof that this is the case. Essentially, TVA's Draft EA and preferred alternative create a misleading "solution" to a problem that is not real.	As discussed in TVA's responses to comments regarding the underlying purpose and need for this proposal, TVA has revised section 1.1 of the EA with more information regarding the underlying need to better align rates with costs across customer classes. As stated in the revised section 1.1, TVA projects that residential DER as well as commercial and industrial investments in renewable energy will increase cost shifting.
58	Memphis AARP Branch, Tennessee State Conference NAACP Environmental Justice Committee, Herman Morris	TVA seems to inexplicably have changed its attitude towards energy efficiency in the past few years, deviating wildly from its conclusion in its 2015 Integrated Resource Plan (IRP) that it should work with local power companies (LPC) towards a common goal of increasing deliveries of efficiency programs. While TVA pays lip service to energy efficiency programs, particularly home weatherization programs that benefit low income communities, it appears	TVA's mission involves balancing multiple objectives. TVA's proposed rate change would only slightly change incentives for energy conservation, energy efficiency, and DER. Billing would continue to be largely determined by usage: more electricity usage would result in higher bills to the consumer, whereas less electricity usage would result in lower bills.

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		<p>to be actively working to make these programs less economic and to stifle continued growth of these important programs across the Tennessee Valley.</p> <p>According to Synapse Energy Economics, "Since 2011, the Tennessee Valley Authority 's industrial and direct serve customers have benefitted from a nearly 20% cut in the price of energy, while residential customers have experienced steady rate increases....the average price of electricity for residential customers has increased above 10 cents per kilowatt-hour for residential customers, but industrial customers directly served by TVA have seen prices drop to approximately 4 cents per kilowatt-hour." TVA's response to the Synapse report was to note that industrial rates are lower than residential rates because the cost to serve large customers is lower than the cost to serve small customers. This is not unique to TVA. Yet as the Synapse report notes, TVA is the only large Southeastern utility that is systematically changing rates to favor its industrial customers even more.</p>	<p>Better cost alignment and improved pricing signals would allow TVA to continue to provide power at the lowest feasible cost, consistent with the mandates of the TVA Act.</p> <p>In its assessment, TVA found that the proposed rate change would likely only marginally influence the rate of investment in energy efficiency and DER among Valley consumers. The incentive to invest in energy efficiency and DER would certainly not be eliminated; it would be marginally decreased. TVA has added additional information to the EA regarding potential changes in investment of DER. TVA estimates that the payback period of a typical rooftop solar investment would increase by about one year, from approximately 15 to 16 years. As addressed in section 3.3, literature suggests that this change would not result in a significant change in DER investment.</p> <p>TVA allocates costs to customers as described in detail in Appendix C of the EA; TVA is not systematically changing rates to favor any class of customer. The drop in total costs recovered from the large manufacturing class has dropped in total over the past five years due primarily to the loss of a single large manufacturing customer (United States Enrichment Corporation or "USEC") that ceased operations; please refer to TVA's published 10-K for fiscal year 2014 (http://www.snl.com/IRW/Docs/4063363).</p> <p>Although costs recovered from large manufacturing</p>

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			<p>customers dropped in total, the non-fuel cost recovered per kWh from large manufacturing customers rose 20% from 2012 to 2016 while the non-fuel cost recovered per kWh from standard service customers rose 8% over the same period.</p> <p>As demonstrated in Appendix C of the EA, the revenue recovered from the large manufacturing customer class closely aligns with the cost to serve that class. Large manufacturing customers have a lower cost of service than standard service customers even when evaluated under the quite different methodologies favored by TVA, by TVPPA, and by TVIC. There are several reasons for this, including the fact that large manufacturing customers generally have high load factors and tend to take more power in milder seasons and at low demand hours. Fuel costs per kWh for all three broad customer classes decreased from 2012 to 2016; standard service fuel costs decreased 18% while large customer fuel costs decreased 20%.</p> <p>TVA has reviewed the Synapse Energy Economics paper cited by the commenter. The paper does not provide an accurate analysis of TVA's rate-making procedures or proposals, nor does it include adequate information to support its assertion that TVA prioritizes large customers at the expense of small residential and commercial customers.</p>

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59	Memphis AARP Branch, Tennessee State Conference NAACP Environmental Justice Committee, Herman Morris	TVA's Draft EA continues trend of shifting industrial costs to residential customers. TVA is distracting the public from its mostly-complete effort to favor all manufacturers with rates that are so favorable they may represent a subsidy from residential and small businesses. TVA's proposed rate change still advantages large industrial customers, at the expense of residential customers. Recent studies show that over the past 5 years TVA has shifted \$1.4 billion in costs from industrial to residential customers. TVA should be rolling back those changes, not doubling down on them.	<p>As stated in the previous response, TVA's proposed rate change does not favor any class of customer. As demonstrated by Chart 1 in Appendix E of the EA, TVA aims to set rates that recover from each customer class the costs to serve that class. TVA has been persistent in negotiating with both TVPPA and TVIC to reach an agreement to lower the rates for large general service customers (not industrial customers) and thereby reduce the inequitable subsidization of both the standard service (and, by extension, residential and small consumer) and the large manufacturing customer classes by the large general service customer class.</p> <p>The proposed rate change would result in the highest increase in rates for the large manufacturing class, in a small increase in rates for the standard service class, and in a decrease in large general service class rates that would still leave that class with rates well above its cost of service.</p> <p>The commenter states that studies reflect a shift of \$1.4 billion in costs from industrial to residential customers without citing the studies. Costs are allocated by TVA to customers as described in detail in Appendix C of the EA; TVA does not "shift costs." As noted above, the costs recovered from the large manufacturing class has dropped in total over the past five years due primarily to the loss of a single large manufacturing customer (USEC) that ceased operations; please refer to TVA's published 10-K for fiscal year 2014 http://www.snl.com/IRW/Docs/4063363.</p>

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			Although costs recovered from large manufacturing customers dropped in total, the non-fuel cost recovered per kWh from large manufacturing customers rose 20% from 2012 through 2016 while the non-fuel cost recovered per kWh from standard service customers rose 8% over the same period. As demonstrated in Appendix C of the EA, the revenue recovered from the large manufacturing customer class closely aligns with the cost to serve that class. Large manufacturing customers have a lower cost of service than standard service customers under the quite different methodologies favored by TVA, by TVPPA, and by TVIC. There are several reasons for this, including the fact that large manufacturing customers generally have high load factors and tend take more power in milder seasons and at low demand hours.
60	Center for Biological Diversity	While we have already explained the principal reasons why TVA's "cost-shift" arguments are baseless, they are unreasonable for an additional reason as well: it has been well- established that TVA has been raising rates for residential customers in order to subsidize its commercial and industrial (C&I) customers. In sum, the 2018 Rate Change proposal leads to the unlawful cross-subsidization of C&I customers by their residential counterparts— especially those low- and middle-income communities negatively targeted by the 2018 Rate Change proposal. The 2018 Rate Change further exacerbates this inappropriate cost-shift, since the EA explains it will even further "lower rates for large commercial customers," at the same time that it will raise rates for many residential	<p>TVA revised section 1.1 of the EA to provide additional information regarding potential cost-shifting. As noted in the section, TVA's forecasted degree of residential solar penetration could result in over a half a billion dollars in costs shifted by consumers with residential solar DER installations by 2030. Potential shifting by commercial and industrial customers is of even greater concern to TVA.</p> <p>Although TVA has had small rate adjustments in the recent years, those increases have been applied evenly to standard service rates, large general service rates, and large manufacturing rates. As explained at length in EA Appendix C, TVA analyzes cost of service from several perspectives. The goal of the cost of service analysis is</p>

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		customers, and particularly lower income residents who use less electricity. EA at 15-16 (emphasis added). Once again, this reveals the absurdity of TVA's claim that these mandatory fees are necessary to address a cost-shift among its customers, and highlights the arbitrary nature of TVA's decision-making.	<p>not to set rates but, rather, to determine how well the rates for a particular customer class recover the costs to serve that customer class. Chart 1 of Appendix C demonstrates that under each of the methods utilized, standard service rates and large manufacturing service rates generally recover TVA's cost to serve those customer classes, within a \$5 per MWh tolerance band. Although the precise ratio of revenue to cost may vary for a customer class from one year to the next, the ratios for both standard service and large manufacturing have generally been within the tolerance band for the past four years. Please note that although both the standard service customers and the large manufacturing customers are within the tolerance bands, the cost of service and, consequently, rates, for standard service customers are higher than the cost of service and rates for the large manufacturing customers.</p> <p>Chart 1 also demonstrates that the rates for large general service customers recover significantly more than the cost to serve that customer class. It is this marked inequity that led TVPPA and TVIC to agree with TVA's proposal to lower energy rates for large general service customers despite the fact that such an agreement will result in 0.3 percent rate increases for both standard service and large manufacturing customers.</p>

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61	Appalachian Voices	<p>TVA's Draft EA misleads the public on the potential impacts of the Grid Access Charge (GAC) on residential customers, particularly low-income households. In fact, the Draft EA supports the conclusion that the large majority of households, including low-income (and therefore, many minority and elderly/disabled) households, will be adversely affected by the proposed Rate Change.</p> <p>The Draft EA clearly states that each alternative ""has the potential to slightly increase the monthly bill for a majority of residential customers,"" but goes on to claim that Alternatives C and D (the higher GAC alternatives) would ""be more beneficial for low-income households, for whom variations in bills due to season or weather are more likely to cause a problem than for other households."" This second statement is misleading in that (a) it attempts to downplay the fact that, by TVA's own admission in the first statement, overall electric bills will increase for the large majority of customers, including low-income customers, and (b) it is not supported by any evidence or analysis, anywhere within the Draft EA, of actual potential bill impacts on a seasonal basis.</p>	<p>The grid access charge would be applied to wholesale rates, not to retail residential rates. TVA has proposed (as Implementing Guidelines to LPCs) default and optional retail rates for LPCs that do not include retail grid access charges for residential consumers. Further, TVA stated in the EA that LPCs may elect to implement a small grid access charge for some or all of their retail customers and emphasized that such impacts would have to be small and have definitive cost bases.</p> <p>TVA has added additional information into the EA regarding the potential impacts to low-income and minority households (section 3.3). Low-income households include low use, moderate use, and high use energy users. As explained in the EA, some low-income households would have an increase in some monthly bills and some would have a decrease in some monthly bills.</p> <p>Bill stability over time is expected to be a benefit to low income households. This is not intended to convey that bill stability would necessarily offset any negative impacts of bill increases, only that it is a benefit relative to an environment of less bill stability. This has been clarified in the final EA.</p> <p>As noted above, TVA's rates are low compared to the U.S. as a whole (see Appendix B and https://www.tva.com/Newsroom/How-TVA-Helps-Keep-Your-Power-Bill-Low). The maximum expected increase in</p>

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			<p>bills would be \$24 per year under Alternative C1, C2, and D. TVA recognizes that this would be a burden to some low-income households. TVA has concluded that any negative impacts resulting from the proposed alternative are not significant under NEPA.</p> <p>It is true that the proposed rate change is expected to result in small increases in monthly bills (up to \$2) for a majority of households. As discussed in the EA, for any particular household, bills could increase in some months and decrease in other months. TVA stated that this would be a negative impact on some households.</p>
62	Southern Current (Hamilton Davis)	We are concerned with TVA's failure to adequately consider the environmental and socio-economic impact of decreased customer investments in distributed energy resources (DERs) like solar and demand side management (DSM) products like energy efficient lighting. TVA claims that the growth of DERs on its system would decrease only slightly at the margins as a result of the proposed rate change. However, no supporting evidence is presented to validate this claim. Increasing fixed charges and reducing volumetric charges could have wide ranging negative impacts on the economic viability of investments in DER and DSM technologies. As DER and DSM adoption grows, the socio-economic and environmental benefits of these resources grow as well. A market analysis should be done to determine the impacts this proposed rate change would have on both DER and DSM investments. Only then can a proper analysis of the environmental and socio-economic impacts of the	<p>In its assessment, TVA found that the proposed rate change would likely to only marginally influence the rate of investment in energy efficiency and DER among Valley retail consumers. The incentive to invest in energy efficiency and DER would certainly not be eliminated; it would be marginally decreased, assuming that households pursuing DER use above-average amounts of electricity. TVA has added additional information into the EA regarding potential changes in investment of DER (see section 3.3).</p> <p>As noted in the EA (section 3.3.2), TVA estimates that the payback period of a typical rooftop solar investment would increase by about one year, from approximately 15 to 16 years. Literature suggests that this change would not result in a significant change in DER investment. As such, there would be little change in the influence of DER on environmental and socio-economic concerns. TVA has</p>

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		proposed rate change be properly considered.	determined that a market analysis is not required to understand these effects, because the changes are small.
63	Southern Current (Hamilton Davis)	TVA fails to adequately assess the benefits that accrue to TVA and its customers from increased adoption of DERs and investment in demand side management.	TVA has addressed this issue in the EA. TVA has also cited literature in its determination that increasing DER investments represent a net cost to TVA and its customers.
63	State of Tennessee Department of Environment and Conservation	This rate change would penalize those who have made weatherization and/or energy efficiency improvements, whether on their own or through outside assistance, or those whose low-usage is due to lack of funds to pay for increased consumption (i.e., lower-income customers). TDEC recommends that TVA (1) provide more detailed information regarding what steps TVA has taken to evaluate the financial impacts and economic burdens to low-income residents that will result from this increase and (2) explain what, if any, rate-payer funded programming will help ease these impacts and burdens across the TVA service territory in the Final EA.	<p>Those who have made weatherization or energy efficiency improvements would continue to benefit; by using less electricity, they would have lower energy bills. It is true that the payback period for investments in energy efficiency or DER may be slightly longer than it otherwise would have been. However, the small change in volumetric rates is not expected to significantly change investment in DER or energy efficiency.</p> <p>TVA has added information to section 3.3. of the EA regarding potential impacts to low-income households.</p> <p>TVA does not provide programming to ease financial or economic impacts, as TVA does not serve retail residential customers. This is the purview of the LPCs that provide electricity to residential customers.</p> <p>To help better manage energy usage, however, TVA offers eScore™ – a program developed through a partnership between TVA and local power companies to provide homeowners with a simple way to make existing homes as energy-efficient as possible.</p>

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64	State of Tennessee Department of Environment and Conservation	TDEC recommends that TVA consider the demographic composition and economic status of the population expected to experience a rate increase and whether there is any group that will bear a disproportionate share of the impacts, and further, that TVA provide a description of the process used to complete this analysis and the resulting conclusions in the Final EA. What proportion of the population in the TVA service area (preferably by state) that is minority and/or considered below the Federal Poverty Level is projected to experience a rate increase?	<p>TVA has data on monthly energy bills for each LPC it serves, but these bills are not tied to individual households and therefore cannot be tied to particular income or socioeconomic groups. Because all income groups can be low, moderate, or high energy users, the proportion of different groups that would see bill increases cannot be predicted.</p> <p>TVA has added information to the EA from existing literature on energy use by income groups and on the proportions of minority groups that are below the poverty level. Based on this information, it is likely that some low-income and minority groups would have increases in some monthly bills and some would have decreases in some monthly bills.</p> <p>Overall, TVA expects that most residential customers including different income and socioeconomic groups, would have slight increases in bills. TVA acknowledges that approximately 70% of the monthly retail residential bills would be higher under the proposed default retail residential rates. Overall, about 40% of monthly retail residential bills would be between \$1 and \$2 higher, about 30% would be less than \$1 higher, and about 30% would be lower. Figure 11 of the EA presents illustrative residential bill impacts of Alternative C1.</p> <p>Because the impacts would be spread across all income and socioeconomic groups, no particular group bears a</p>

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			disproportionate share of the rate increase. TVA recognizes that the burden of increases would be highest on the low-income households as a proportion of their annual income.
65	Appalachian Voices	<p>Despite TVA's broad, unfounded claim that "no particular minority of other socioeconomic group would bear a disproportionate share of negative effects," in actuality a large proportion of low-income, minority and other disadvantaged groups reside in lower energy use rental properties, and so the Rate Change will, in fact, disproportionately harm low-income and minority residents.</p> <p>Despite TVA's claims that low-income and/or minority residents would not be disproportionately impacted, and that the bill increase that will result from the proposed Rate Change will be "minor," it is clear that TVA has not done the appropriate analysis to determine actual impacts to residential customer bills, especially for low-income, minority and/or other disadvantaged residents.</p>	<p>As noted above, TVA has added additional information into the EA regarding the potential impacts to low-income and minority households. Low-income households include low use, moderate use, and high use energy users. As explained in the EA, some low-income households would have an increase in some monthly bills and some would have a decrease in some monthly bills.</p> <p>Bill stability over time is expected to be a benefit to low income households. This is not intended to convey that bill stability would necessarily offset any negative impacts of bill increases, only that it is a benefit relative to an environment of less bill stability. The maximum expected increase in bills would be \$24 per year. TVA recognizes that this would be a burden to some low-income households. TVA has concluded that any negative impacts resulting from the proposed alternative would not be significant under NEPA.</p>
66	Appalachian Voices	The US Department of Energy's Low-Income Energy Affordability Data tool, released in early 2018, shows that there are approximately 830,000 occupied rental properties in Tennessee alone, representing one-third of all households across the state. Of these, 490,000 are part of multi-unit buildings, and as such, are likely to be smaller, and therefore, consume less electricity than the	TVA has added discussion regarding low-income household into the EA, including some analysis based on the data cited by the commenter.

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		average household. In other words, approximately 20% of all Tennessee households can be assumed to house a larger proportion of low-income and/or minority or disabled residents, and use less energy, and will therefore be negatively impacted by the proposed Rate Change. The USDOE's dataset further shows that these renter households already spent as much as 20% of their gross household income on energy costs in 2015.	
67	Appalachian Voices	Every cent by which volumetric rates are reduced extends the payback period for energy efficiency investments by lowering the energy savings value of those investments. In doing so, the proposed Rate Change will also negatively impact energy efficiency finance programs geared toward generating a net savings for participants, such as those based on the Pay-As-You-Save® system of energy efficiency financing which are accessible to all residents regardless of income, home ownership or credit score.	TVA has added discussion regarding payback period for energy efficiency. The small changes in volumetric rates would not be expected to significantly change payback periods or investment in DER or other energy efficiency programs. See also TVA's responses #2 and #6 above.
68	Sierra Club/SELC	In the Draft EA, TVA treats socioeconomic impacts from its preferred alternative as if they were negligible, while elsewhere conceding that large swaths of its most vulnerable customers will see their bills go up. TVA's cursory and glib assessment of socioeconomic impacts is inconsistent with the requirements of NEPA. TVA's proposed rate changes would amount to an effective wealth transfer from TVA's poorer majority customers to a smaller pool of wealthier customers. Nowhere does TVA examine the impacts of this, either in terms of economic stress on a majority of TVA's customers, or for the follow-on impacts of decreased spending power from those	<p>TVA has added discussion on potential impacts to low-income households. TVA acknowledges in the EA that bills will go up for some of its customers in some months. This is true regardless of income or socioeconomic group. However, the maximum increase is expected to be \$24 per year.</p> <p>TVA's rates are low compared to the U.S. as a whole (see https://www.tva.com/Newsroom/How-TVA-Helps-Keep-Your-Power-Bill-Low). TVA acknowledges that any increases would burden some low-income households. In the EA, TVA has concluded that overall socioeconomic</p>

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		customers and the concomitant upwards-concentration of wealth in the Valley.	impacts are not significant for the purposes of NEPA.
69	Sierra Club/SELC	TVA fails to consider the economic benefits offered by DER adoption, first at the distribution level, with the potential to provide benefits at the transmission level as well: use of DER can prevent system costs due to grid congestion or generation needed to offset line loss; DER resources can also enable a grid to be more robust and resilient to outages. To the extent that TVA expects and intends for its proposed rate changes to disincentivize further DER adoption, TVA must consider the costs of eschewing the benefits such DER would have conferred. Yet, it has not.	TVA has addressed this issue in the EA. TVA also discusses the burden of DER related cost shifting. The proposed rate change would have only a marginal impact on future DER investment since the payback period may be slightly longer (increase from 15 to 16 years). However, TVA does not expect this marginal influence to “disincentivize further DER adoption.”
70	Sierra Club/SELC	TVA fails to present any evidence or hard numbers concerning the purported cost shift from DER-using customers to the rest of the customer base. Although TVA does forecast a two percent DER adoption rate by 2030 (Draft EA, 25), it bewilderingly does not include any similar forecasting of socioeconomic impacts from this adoption. TVA could and should provide such information. Similarly, TVA should also explain how this compares to the slight upward pressure on rates it identified in the out-years of the 2015 IRP for the “Maximize EE” strategy	TVA added additional discussion to the EA regarding how the proposed alternative would affect investment in DER. TVA estimates that under Alternative C1, C2 and D, the payback period for a typical DER solar installation would be increased by about one year, from approximately 15 years to 16 years. This is not expected to significantly change investment in DER. Given the small changes in energy rates and the expected small changes in DER investment, no additional analysis is warranted. See also TVA’s responses to comments #14 and #22.
71	Sierra Club/SELC	Although the Draft EA quantifies the potential rate impacts associated with three levels of grid access charge, it does not quantify the potential impacts associated with maintaining the status quo, the “No Action” alternative.	See TVA’s response to comment #70.

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		Since TVA makes assumptions about the projected levels of DER penetration in 2030, it should be able to calculate those rate impacts and compare them to the impacts of the alternative, for different classes of customers. Only if TVA performs such an analysis can the Board and ratepayers understand the relative socioeconomic impact of taking no action versus imposing the grid access charge TVA has proposed.	
72	Sierra Club/SELC	<p>TVA's proposed rate change is also likely to engender significant environmental impacts by lowering the marginal cost of power in TVA's territory, encouraging increased electricity consumption. Although TVA asserts (without showing its work) that its assessment of price elasticity in its territory would mean that its preferred alternative would result in a "minor decrease of 0.01 percent of sales," TVA appears to be making some very basic errors in how it addresses how consumers respond to price changes. Draft EA, 33-34. TVA appears to be calculating how changes in overall bills would impact consumer demand from a price elasticity perspective, without realizing that it is changes in rates that interact with elasticity. Put another way, the most important aspect for assessing changes in consumer behavior in response to price changes is the marginal price, not the total price. Faced with cheaper marginal costs (even on top of higher fixed charges), rational economic actors would consume more.</p> <p>As an example, for all sectors combined in Tennessee, current prices are 9.53 cents per kWh. Draft EA, Appendix B, Table B-1. Under TVA's preferred alternative, this would decrease to 8.53 cents, a swing of 10.5 percent. Using TVA's claimed elasticity figure of -0.15 (Draft EA, 3027),</p>	<p>TVA applied price elasticity appropriately. The study of price elasticity, on which the estimates used in the EA are derived, is based on average electricity prices, not marginal prices.</p> <p>While it is true that economic theory suggests consumers should base their decisions of how much to consume on the marginal volumetric rate, consumers do not necessarily make decisions based solely on economics. Borenstein (2009) notes that consumers make decisions often with limited information and attention and "will engage in behavior that may depart significantly from the perfectly optimizing paradigm. The constrained optimizing behavior in which a consumer does engage may still be a fairly sophisticated response to the limited information environment, or it may be a very simple rule of thumb." He also states, "It seems safe to say that not only do most consumers not know how much power or water they have used since their current billing period began, most consumers don't know when their current billing period began." (Borenstein 2009) Partly because of this behavioral issue and partly because of the data available,</p>

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		<p>this would suggest an increase in electricity demand of 1.6 percent—an extremely large amount, given that TVA admits that it does not forecast any system demand growth at present. Potential demand increases under Alternative D, with its 2.5 cent reduction in wholesale prices per kWh, would result in a roughly four percent increase in electricity consumption. Plainly, such extremely large increases in electricity consumption would have a significant environmental impact, as TVA would have to generate more power to meet that additional demand. Given that many of the marginal generating assets that TVA currently possesses are fossil-fired, much of that increase would likely be met by additional coal or gas combustion, with attendant increases in greenhouse gas emissions, emissions of other air pollutants, and increased water pollution and water withdrawals for cooling.</p> <p>Thus, in addition to shifting generation between DER and TVA-held resources, TVA's proposed rate change is likely to impact the total amount of energy generated in the system, and therefore the amount of environmental harm caused by that system. TVA's failure to address these impacts in the Draft EA is contrary to the requirements of NEPA.</p>	<p>studies of price elasticity for electricity often use average rather than marginal prices where the average price blends any fixed and marginal costs. For example, Ros (2015) derives average electricity prices from FERC data on revenue and sales for use in estimating price elasticity. The proposed rate change is not likely to change the operation of TVA's current operating assets, nor result in an alteration or addition to those assets.</p>
73	Center for Biological Diversity	<p>TVA must consider the adverse impacts of the overall rise in electricity costs it is proposing for those on the lower end of the spectrum of residential electricity usage, which includes communities seeking to use less energy either for energy conservation goals or economic savings and will include lower income families. TVA must consider the</p>	<p>TVA discusses such impacts in the EA. TVA has added additional information into the EA regarding the potential impacts to low-income and minority households (see section 3.3). Low-income households include low use, moderate use, and high use energy users. As explained in the EA, some low-income households would have an</p>

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		inevitable adverse impacts of raising electricity prices for those who can least afford these increased costs. The EA is void of this basic analysis on TVA's most economically vulnerable consumers.	increase in some monthly bills and some would have a decrease in some monthly bills. Bill stability over time is expected to be a benefit to low income households This is not intended to imply that it would necessary offset any negative impacts of bill increases, just that it is a benefit relative to less bill stability. TVA recognizes that this would be a burden to some low-income households.
74	Center for Biological Diversity	<p>TVA's alternative claim throughout the EA that, in fact, the 2018 Rate Change will not impact consumer behavior fails on multiple, commonsense levels. First and foremost, if the alternative claim is true, the 2018 Rate Change would be patently arbitrary and capricious, since changing behavior is the entire purpose of the Rate Change. In other words, this claim is self-contradictory. TVA claims (erroneously, as we will explain) that these rate changes are necessary because current rates "over incentivize customer installation of" DER, shifting costs to non-DER customers as DER customers' bills go down. EA at 1-2. If, in fact, the 2018 Rates will not address such "over incentives" by, in fact, discouraging DER adoption, then they will not serve TVA's stated purpose and need.</p> <p>In short, under this presumption, TVA is undertaking a \$1.2 billion shift in its rate-recovery approach, and introducing an unprecedented mandatory fee to all residential customers that penalizes DER and energy efficiency while rewarding increased energy use, for no reason at all, since no one, in TVA's estimation, will change their behavior. If this is not an example of arbitrary</p>	<p>TVA is not claiming that the change would have no effect on consumer behavior. Rather, because the changes in energy rates are relatively small, there would be relatively small changes in behavior. Because some households would be projected to decrease energy consumption slightly while others would be projected to increase slightly, the net effect of the proposed changes would also be small. Consistent with the recommendation of NARUC (addressed in section 1.1), TVA is acting to address the situation proactively. Removing the "over-incentives" for installation of DER would only marginally decrease future adoption of DER.</p> <p>DER and cost-shifting are one aspect of the purpose and need for recommending the proposed action. A major component of the purpose and need arises from the need to better align rates with costs across customer classes, and to make large commercial rates more reflective of cost to serve as well as more competitive.</p> <p>TVA does provide a projection that DER penetration would be 2 percent of residential households by 2030 and has</p>

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		and capricious agency decision-making, it is hard to imagine one that would qualify.	added information to Section 1.1 of the EA regarding cost-shifting.
75	Center for Biological Diversity	TVA's claim—that the rate change will not impact consumer behavior—is patently wrong; the 2018 Rate Change will impact consumer behavior in important ways. For example, with these new price signals, fewer consumers will invest in DER, and more consumers will rely on TVA's dirty central energy for more of their electricity needs. Thus, as we have explained, one federal study found DER to be "highly sensitive" to retail rate structures, and another found even a one-year delay in the payback period can negatively influence DER adoption rates. LBNL Report at 1 (See Attachment 1); NREL Report at 1 (See Attachment 5).	<p>As stated above, TVA is not claiming that the change would have no effect on consumer behavior; TVA is claiming that because the changes in energy rates are relatively small, there would be relatively small changes in behavior. Because some households would be projected to decrease energy consumption slightly while others would be projected to increase slightly, the net effect of the proposed changes would also be small.</p> <p>After considering this comment, TVA has added information from the LBNL Report into the EA. The graphs on 42 of the LBNL Report clearly indicate that small changes in either the payback period or the monthly savings would not have a large effect on DER adoption. The only exception is that there would be a large difference between 7 and 10 years. TVA estimates that the payback period for a typical household solar DER would change by about one year, from 15 to 16 years, which based on the information in this paper would only slightly slow DER adoption rates.</p> <p>TVA agrees that DER adoption rates can be affected by rate structures and rate levels. However, the small changes expected at the retail rate level would not be expected to induce large changes in DER adoption.</p>

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76	Center for Biological Diversity	While the EA claims these rate changes will help lower-income customers who cannot afford DER, it is precisely those customers who use less energy for economic reasons. Since the 2018 Rate Changes will raise rates for those using less energy and lower them for those using more, it could not be more clear that the Rate Change proposal actually will harm the very customers that TVA claims the 2018 Rate Change is intended to benefit.	<p>TVA has clarified in the EA its statements about the benefits of bill stability to low-income households. More stability is generally beneficial compared to less stability, all other things being equal.</p> <p>In the EA, TVA has also added additional information regarding the potential impacts on low-income customers. Because low-income customers can be low, moderate, or high energy users, some would have small increases in bills (up to about \$2 per month) and some would have small decreases. The change in bills would be related to energy use, not income status.</p> <p>TVA recognizes that any increases would be more as a proportion of income for low-income households, and that some low-income households may be burdened by the proposed alternative.</p>
77	Center for Biological Diversity	The EA also claims that a benefit of this rate change will be to provide greater stability in bill amounts across seasons, and asserts that this benefits low-income households, “for which seasonal fluctuations can result in financial hardships.” EA at 29. Again, absolutely no data is cited in support of this assertion, nor is there any discussion of other mechanisms available to address any such concern, such as bill averaging programs provided by many utilities. Thus, any need for stabilizing monthly fees can be addressed with payment mechanisms which are already employed in other jurisdictions.	Bill stability is not the purpose of the proposed rate but one of the benefits of that proposal. Generally, bill stability is a benefit for low-income households because less stability in electric bills (i.e., having large swings in bills across the year and much higher than average retail bills during the warmest and coldest parts of the year) would result in higher peak bills at certain times of the year than if there was more stability. For those with low incomes, higher peak bills are typically harder to pay than lower peak bills. Therefore, any additional stability provided by the proposed alternative compared to less stability without

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			<p>would be a benefit for low-income households, all else equal.</p> <p>TVA notes that, as with all impacts discussed, this benefit would likely be marginal because the changes in rates are marginal. Bill stabilization is considered a potential effect of the proposed rate change, rather than an underlying need. TVA has clarified section 1.1 of the EA.</p>
78	Center for Biological Diversity	<p>The EA also makes unsupported assumptions about which types of customers may change their energy usage in response to the new rate structure, concluding that the rate change will not result in any meaningful consumption change. EA at 29. These assumptions are wrong and contradict TVA’s purpose for changing rates. While TVA appears to base these assumptions on what it claims are “historical price response[s],” EA at 30, several studies and commonsense economic principles lead to the opposite conclusion: rate structures that reduce per kWh energy prices also reduce the incentive for conservation behavior and investments in efficiency, resulting in increased electricity usage (as TVA proposes to do here, see EA page 28), to the benefit of TVA’s revenue. Therefore, TVA’s assumptions that the proposed rate change will not influence or alter electricity consumption defy commonsense economic principles, studies, and the utility’s own revenue generation intent.</p>	<p>TVA’s conclusions are fully consistent with both economic studies and common sense reasoning. TVA has acknowledged that changes in prices change incentives and that customers would change consumption accordingly. Because the price changes are small, however, the changes in consumption would be small. In addition, some customers would face incentives to increase energy use and some customers would face incentives to decrease energy use. The net effects of these changes would be expected to be small.</p> <p>The proposed rate change would not raise additional revenue. A rate change is the process by which TVA changes the structure of the rates or the allocation of costs. Rate changes are designed to be revenue neutral to TVA.</p>

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79	SACE	Because the retail rate structures that TVA's GAC will promote are intended to encourage load growth, benefitting customers with higher energy usage, TVA's lower-income residential customers will be disproportionately impacted. Depending on the retail rate structure and ultimate level of the GAC, these customers will see their energy burden increase by between 0.1% and 1.9% system wide. At the LPC level, the average impact on lower-income households could be as much as 2.8% of their annual household income. Minority households, the elderly, and renters will be the most disproportionality impacted customers under TVA's proposed rate structure in the Draft 2018 Rate EA.	<p>It appears that the commenter is incorrectly assuming that the grid access charge, which would apply only at the wholesale level, would be applied to or fully passed on to retail customers. As described in the EA, this would not be the case. Under the default retail rates, the maximum expected increase in monthly bill would be \$2, which would be \$24 on an annual basis. A household would have to have an annual income of less than \$900 for this amount to be 2.8 percent of annual income.</p> <p>Further, the proposal is not intended to encourage load growth (see Section 1.1).</p>
80	SACE	In the Draft 2018 Rate EA, TVA does not adequately address socio-economic impacts of any of its alternatives. To the extent TVA attempts to address socio-economic impacts, TVA continually contradicts itself when categorizing potential negative effects on minority or lower-income residential customers as alternately uncertain or conclusively negligible. For example, TVA first claims that "no particular minority or other socioeconomic group would bear a disproportionate share of negative effects." Later in the document, TVA admits, however, that "the potential impacts of (its preferred Alternative) Alternative C to [LPC] customers is difficult to assess precisely." Yet, TVA goes on to admit that "each alternative has the potential to slightly increase the monthly bill for a majority of residential customers." In fact, TVA claims residential customers who have a high usage would see a decrease in their average monthly bills, while low-usage households would see increases in average	<p>In response 54, TVA addresses these statements in the draft EA. TVA does not believe that these conclusions are contradictory. It is true that potential impacts have some uncertainty, because the impacts depend on the interaction of TVA's proposed alternative and future decisions of LPCs and their customers, as well as other market forces. However, TVA has analyzed the expected impacts based on the available information.</p> <p>The conclusion that impacts would not be significant under NEPA is based on TVA's analysis providing that changes to bills would be relatively small, up to \$2 per month. This relatively small increase that would affect customers across all income levels led TVA to conclude that minority and low-income consumers would not be disproportionately impacted. Because this analysis has some uncertainty does not mean that conclusions based</p>

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		monthly bills. Taken together, these statements show that even while claiming that any impact would be insignificant, TVA has not done the appropriate analysis to determine actual impacts to residential customer bills.	on the analysis are contradictory. That said, TVA has added additional detail on its analysis of impacts in section 3.3.
81	SACE	<p>"Mandatory fees disproportionately harm low-income, minority and other low-usage customers groups. Increased fixed charges shift costs to low-income, elderly, and minority ratepayers. This has the effect of decreasing the incentive to reduce usage through methods of bill control such as energy efficiency or clean distributed generation like solar. On average, low-income households have higher energy burdens and lower energy usage. When income is low, even an average energy bill represents a significant economic burden. Low-Income Energy Affordability Data (LEAD) tool raw dataset reflects that low income households use approximately less 33% less energy and that over 40% of households in TVA territory are considered low income; these lower income customers could be significantly harmed by TVA's proposed GAC.</p> <p>Because the retail rate structures that TVA's GAC will promote are intended to encourage load growth and will thus benefit customers with higher energy use, TVA's lower- income residential customers will be disproportionately impacted. Depending on the retail rate structure and ultimate level of the GAC, these customers will see their "energy burden" increase by between 0.1% and 1.9% system wide. At the LPC level (see Appendix B), the average impact on lower-income households could be as much as 2.8% of their household income."</p>	<p>As noted above, it appears that SACE is incorrectly assuming that the grid access charge, which applies only at the wholesale level, would be applied to or fully passed on to retail customers. As described in the EA, retail customers served by LPCs in TVA's service area already have a fixed monthly customer charge and a volumetric energy charge. The default retail rate proposed by TVA would not increase the monthly customer charge nor add a retail grid access charge. LPCs could, subject to TVA approval, seek alternative rates that increased the monthly customer charge or implemented a retail grid access charge, but TVA would limit the amount of any increase, as explained in the EA.</p> <p>The maximum expected increase in monthly residential bills would be \$2, which would be \$24 on an annual basis. A household would have to have an annual income of less than \$900 for this amount to be 2.8 percent of annual income.</p> <p>TVA has added additional information regarding potential effects on low-income customers. Low income customers are likely spread across low, moderate, and high energy use groups. Therefore, the potential negative impacts on these customers would vary. Some would likely see a</p>

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			range of increases in some of their monthly bills up to \$2, and some would likely see a decrease in some of their monthly bills. TVA acknowledges that the increases could be a burden on some low-income households.
82	SACE	In addition to obscuring the direct effect its actions would have on customer bills, TVA insidiously argues a duplicity that “Low-usage households’ monthly bills would increase more than other households as a proportion of household income” while also claiming that “Alternatives C and D would...be more beneficial for low-income households, for whom variations in bills due to season or weather are more likely to cause a problem than for other households.” Under no scenario is increasing electric bills “more beneficial for low-income households.”	In the EA, TVA states that more stable bills would be a benefit compared to less stable bills, all else equal, and that bill stability provides more benefit for low-income households than other households. TVA does not claim that more stable bills would necessarily offset any negative impacts of bill increases. TVA has clarified the language in the EA.
83	SACE	If TVA customers are requesting bill stability, there are alternatives beyond radical structural rate changes. The GAC in the Draft 2018 Rate EA, if passed through by LPCs to their customers in the form of mandatory fees, would reduce the effectiveness of pre-pay programs that better manage seasonal or monthly electric bills.	Bill stability is described in the EA as a potential impact of TVA's proposal, but is not the purpose and need driving this proposal. TVA is proposing small changes in rate structures at the wholesale level. As explained in the EA, TVA has proposed implementing guidelines to limit the extent to which LPCs may pass on the proposed wholesale grid access charge to retail customers.

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84	Tennessee Advanced Energy Business Council, J. Atkins, F. Adom,	<p>The proposal would deter economic development. Companies seeking sustainable practices would not locate or invest in the Valley. Charging for access to TVA's grid is not in the best interest of TVA, local utility partners, and customers. By adding an access fee, TVA will lower interest in companies looking to move into the TN valley. Many of these companies use sustainable practices, to reduce cost overhead. Adding this fee will deter some of these companies, who would otherwise bring thousands of jobs, which would lead to more customers.</p>	<p>TVA's and LPCs' rate structures for commercial and manufacturing customers are similar to those used in other parts of the country. TVA knows of no reason to expect that the proposed alternative would make the Tennessee Valley less attractive to businesses, including those that consider sustainability an important part of their business plan.</p> <p>The proposed rate change alternatives, including Alternative C1, preferred by TVA, would lower rates for large general service customer classes, making them more competitive than they are currently. This would be expected to provide incentive for additional investment in the Valley.</p>
85	SACE	<p>TVA did not adequately address negative impacts of the preferred alternative because it failed to sufficiently analyze impact of LPC implementation. It is clear that TVA intends to bill LPCs for the GAC as a monthly wholesale charge, fixed in advance of the October deadline for rate changes by LPCs. As recently as November 2017, TVA indicated a preference for a combination of a grid service charge and declining block rates to translate the wholesale GAC (then called a Grid Service Charge) to retail rates. Yet even though TVA considered this option, it did not analyze its impacts or provide any rationale as to why its LPCs would choose to collect a monthly charge by adopting declining block rates, rather than continuing to increase mandatory fees. TVA's failure to consider this possibility in its Draft 2018 Rate EA is misleading at best. In our view, it is most likely that LPCs will raise mandatory</p>	<p>TVPPA requested that TVA develop default rates that did not include a fixed monthly charge, and in response to that request, TVA's staff developed default retail rates that do not include grid access charges for retail residential customers. TVA has also developed optional rates for LPCs to consider; the optional rates also do not include grid access charges for retail residential customers. LPCs may submit customized retail rate requests to TVA for approval. All customized rate requests would be evaluated consistent with the TVA board approved rate review process. As explained in the EA, TVA has proposed implementing guidelines to limit the extent to which LPCs may pass on the proposed wholesale grid access charge to retail customers.</p>

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		fees to collect the monthly charges.	
86	Memphis AARP Branch, Tennessee State Conference NAACP Environmental Justice Committee, Herman Morris	Adding to our concern, while TVA claims that it is up to each individual LPC how the rate changes will be passed on to LPC customers, it lays out a suggested approach in the Draft EA for how LPCs can pass on these rate increases to end-use customers via declining block rates. There is no associated analysis in this draft EA regarding declining block rates, but we are highly skeptical of this approach.	<p>Analysis of the proposed default retail rates for residential and small commercial and industrial consumers was presented in the draft EA in section 3.3.2. The section has been updated to include analysis for Alternative C1. The implementing guidelines associated with the rate change are described in chapter 2.</p> <p>The proposed default residential retail rates would increase the current residential energy rates for the first block of 500 kWh by \$0.002 and for the second block of 500 kWh by \$0.002. The rate for all kWh over 1,000 per month would be decreased slightly, by approximately \$0.005. TVA's analysis demonstrated that the proposed default retail rates would limit monthly customer impacts to no more than \$2, would result in bill reductions in months in which customers used in excess of 1,400 kWh, and would provide both the opportunity and the incentive for consumers to control their bills by reducing consumption.</p>
87	Memphis AARP Branch, Tennessee State Conference NAACP Environmental Justice Committee, Herman Morris	What is most likely, though not analyzed in the Draft EA, is that LPCs will pass on costs incurred by TVA's 2018 rate change by implementing new or increasing current fixed fees on residential customers bills. If implemented, TVA's proposed change would likely result in an average electricity customer paying a total over \$350 per year before they even flip a switch - or almost \$30 a month in fixed charges. On its own, this particular 2018 rate change proposal would add \$145 per year, or a little over \$12 a month, to the current average fixed fee on a residential	TVA anticipates that LPCs would pass on the power costs allocated to the wholesale standard service grid access charge through volumetric retail energy charges. Indeed, both the proposed default retail rates described in the EA and the proposed optional retail rates provide for such recovery. TVA states in the EA that TVA assumes for the sake of analysis that LPCs would adopt the default rate, which TVA believes would closely approximate the actual results. Further, TVA stated in the EA, that LPCs may elect to implement a small grid access charge for some or

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		customer's bill.	<p>all of their retail customers and emphasized that such impacts would have to be small and have definitive cost bases.</p> <p>TVA estimates that under Alternative C1, TVA's preferred alternative, no residential customer would see an increase in their monthly bill of more than \$2 a month. In the proposal, TVA would apply a series of thresholds to ensure that retail bill impacts associated with the translation of wholesale changes to retail would be implemented gradually by LPCs; TVA would limit the amount of revenue recovery allocated to any single retail rate class and the amount of rate increase for any single customer within that retail rate class. To ensure that retail bill impacts would be consistent with the wholesale rate actions, TVA proposes that a maximum increase for residential customers would be no greater than \$2 per customer per month.</p>
88	C. Koczaja	If energy prices currently "over-incentivize consumer installation of DER" (as stated in the draft EA discussion of Alternative A, the No Action Alternative), then how can the penetration of DER only "be slowed marginally" under Alternatives C and D? A documented analysis needs to be completed to justify this statement since a decrease in energy from DER would be replaced with the TVA's generation mix making the "indirect, limited, and essentially indiscernible" environmental impacts offered in the EA significantly understated.	The degree to which current energy rates over-incentivize consumer installation of uneconomic DER would only be slightly reduced by the proposed \$0.005 per kWh reduction in rates and the implementation of a wholesale standard service grid access charge (Alternative C1, TVA's preferred or Alternatives C2 or D). The proposed changes at retail are so slight that they would not have a significant impact on either consumer decisions to install DER or on the associated payback period for DER installations. The analysis does not demonstrate a significant change in energy usage associated with the proposed rate change and there would be no, limited, or

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			essentially indiscernible environmental impacts compared to the current conditions.
89	Sierra Club/SELC	What is missing entirely is any calculation of any fixed costs of service, of any system costs imposed by the “DER” TVA complains of, or of how far TVA’s considered alternatives would address such claimed problems—or any data that would be used to support such calculations. TVA’s lack of transparency here is troubling, but consistent with TVA’s apparent unwillingness to divulge the data underlying its assertions. As but one example, Commenters previously asked TVA through a Freedom of Information Act request for a cost of service study, but only received an eight page summary, not the underlying data. This failure by TVA to support its assertions not only makes it impossible for stakeholders to meaningfully evaluate TVA proposals that impact the entire region, but it is fatal to the NEPA process.	<p>TVA appended its Cost of Service Fiscal Year 2016 study as Appendix C of the EA to provide a summary of the wholesale cost of service methodologies and results. The study was included in the EA to provide information about TVA’s fixed costs. To calculate the Cost of Service study, TVA compiles voluminous hourly LPC and customer load data which is very commercially sensitive for TVA, its various LPC partners and their retail customers, and its directly served customers.</p> <p>TVA notes that it does not state in the EA that DER itself imposes costs to TVA. Rather, TVA notes that those that have DER do not pay their fair share of the fixed costs of operating and maintaining the system that still provides valuable service to them.</p>
90	Center for Biological Diversity	<p>Particularly given that the purpose of the 2018 Rate Change is to target DER customers who TVA considers to be engaged in “uneconomic” activity, TVA cannot ignore the inevitable dampening effect the 2018 Rate Changes will have on DER adoption on the grounds that it is too speculative to analyze. TVA must reasonably analyze the inevitable increase in consumer reliance on dirty central energy production that will result from both aspects of the 2018 Rate Change:</p> <ul style="list-style-type: none"> • First, the shift to mandatory fees, which will add years to the payback period for homeowners who seek to invest in DER, and make financing and other legal instruments that have fostered DER growth less accessible and desirable – 	<p>In response #11, TVA addresses its use of the term “uneconomic DER” in the EA. In response #6, TVA addresses the effects on the DER payback period and incentives for energy efficiency. As noted in those responses, TVA has updated the EA in response to these comments and to clarify its discussion.</p> <p>TVA has not suggested mandatory fees as a way to address retail rate designs. As noted in the EA, TVA has proposed default and optional retail rates for LPCs that do not include retail grid access charges for residential consumers. This approach largely maintains the LPCs’</p>

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		<p>all resulting in inevitable reductions in DER adoption, thereby requiring those lost renewable energy resources to be generated from TVA central power sources;</p> <ul style="list-style-type: none"> • Second, the added incentive the 2018 Rate Change provides for increasing electricity usage, by charging customers less when they use more. TVA cannot, on the one hand, proceed contrary to sound conservation practice and commonsense logic by encouraging additional electricity usage rather than promoting the very energy conservation measures we desperately need, while at the same time ignoring the inevitable effects of those price signals by failing to consider the additional power production that will be necessary to meet the new demand TVA's prices are intended to generate. 	<p>current volumetric retail rate structures. The majority of LPCs currently offer time of use rates for residential customers; however, there is almost no subscription to these rates.</p> <p>Also, see TVA's response to comment 2 regarding energy conservation and unchanged usage. See also the response to comment #91 below.</p>
91	Memphis AARP Branch, Tennessee State Conference NAACP Environmental Justice Committee, Herman Morris, SACE, TenneSEIA	<p>TVA ignores the significant impact the proposed rate structure changes would have on TVA's generation mix over time and the resultant environmental impacts.</p> <p>Evidence suggests that if implemented, these rate structure changes would result in a 40% decrease in growth of DER in TVA's service territory . This means that TVA would be relying more heavily on electric generating units that negatively impact the environment and public health. Yet TVA has concluded hastily that its Draft EA, under any alternative, would have minimal or negligible impacts on the environment. In order to meet NEPA requirements, TVA must undertake full EIS analysis of all potential impacts on the environment and public health. (Memphis AARP Branch; Tennessee State Conference NAACP Environmental Justice Committee; Herman</p>	<p>TVA's analysis presented in the EA demonstrates that the expected changes in customer usage are negligible under Alternatives B, C1, C2, and D. Consequently, the expected changes to generation are correspondingly small.</p> <p>The commenters' reference to evidence of decreases in the growth of DER cites to information (shown on a slide during a presentation) that presented analysis relating solely to large general service customers and the potential for them to recognize savings from the installation of uneconomic on-site solar.</p> <p>The slide (Slide 5) was included in a presentation made by TVA in 2017 to TVPPA's Rates and Contracts Committee and has been the basis for incorrect conclusions from several commenters. Commenters interpret the slide as an indication that if implemented, the proposed rate structure</p>

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		<p>Morris)</p> <p>TVA's private conversations with LPCs and direct serve industrial customers include substantial evidence that TVA, in fact, believes that the changes it proposes will be extended and eventually have a substantial impact on DER, energy efficiency, and other aspects of customer generation. Yet TVA ignores the significant impact the proposed rate structure changes would have on TVA's generation mix over time and the resultant environmental impacts. Evidence suggests that if implemented, these rate structure changes would result in a 40% decrease in growth of DER in TVA's service territory. This means that TVA would be relying more heavily on electric generating units that negatively impact the environment and public health. Yet TVA has concluded hastily that its Draft 2018 Rate EA, under any alternative, would have minimal or negligible impacts on the environment. In order to meet NEPA requirements, TVA must undertake full EIS analysis of all potential impacts on the environment and public health caused by a decrease reliance on DER resources. (SACE)</p> <p>In July and August 2017, TVA stated that DER is a "threat to our business model" and that the recommended rate restructuring would decrease the number of economic, on-site solar installations by 40%. This conflicts with the conclusions of the EA, which states that under Alternatives C and D, that changes in customer usage would "be so small that any associated changes in TVA power</p>	<p>changes would result in a 40% decrease in growth of DER in TVA's service territory. The commenters misread this slide. It does not address the effects of the rate change, reduced energy rates, or the wholesale standard service grid access charge.</p> <p>Actually, the slide analyzed how many large general service customers, served either under wholesale nonstandard wholesale rates or TVA direct service rates, could benefit economically under the current rate structure from installing on-site solar. TVA's analysis showed that virtually all of the large general service customers could benefit economically from the installation of on-site solar. The analysis did not consider how many of the customers planned to install on-site solar. The analysis demonstrated the need to reduce large general service rates and to move at least some fixed cost recovery from volumetric rates to fixed monthly rates to avoid unfair cost shifting.</p> <p>The slide demonstrated that without rate restructuring, TVA would be sending large general service customers a signal that it would be cheaper to self-generate than to purchase from TVA or their LPC. It would be an erroneous signal caused by the fact that much of the cost of having capacity available to serve the customers is recovered through an energy charge even though the level of cost for having capacity available to serve the customer is not tied to usage but to demand.</p> <p>The slide was developed when TVA was proposing a contract demand charge for large customers. A contract</p>

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		generation and any resulting ambient air pollution or GHG levels would not be identifiable." (EA p. 39). If TVA sees the lost revenues from a potential increase in DER penetration as a fundamental threat to its business model, then it hard to see how the environmental benefits of those emissions-free solar installations would not be identifiable. (TenneSEIA)	demand charge for large customers would be similar to the wholesale grid access charge for local power companies. The implementation of the contract demand charge considered in that analysis would have reduced the amount of DER capacity that would be financially beneficial to the large commercial customers by 40%.
92	SACE	<p>TVA fails to properly analyze impact of Proposed Grid Access Charge on commercial and industrial customers: TVA claims that the Draft 2018 Rate EA is intended to "improve the alignment of wholesale rates with their underlying costs to serve ..." But as documented extensively in TVA's Strategic Pricing Plan communications over the past several years, TVA's proposed GAC serves two additional purposes: to discourage energy efficiency and DER and to perpetuate and expand a hidden subsidy to large industrial customers.</p> <p>.... In fact, TVA has previously found that energy efficiency investments are economic. In its 2015 IRP, TVA concluded that it should achieve energy efficiency savings between 900 and 1,300 MW by 2023. TVA states its intention and "work with LPCs to refine delivery methods, program designs and program efficiencies, with the goal of lowering total cost and increasing deliveries of efficiency programs." Now in this Draft 2018 Rate EA, TVA contradicts its own analysis, presuming that customer investment in efficient lighting technologies may have undesirable economic impacts."</p>	<p>As stated in the EA, the purpose of the proposed rate change is to refine the structure of its wholesale electric power rates through pricing that better aligns wholesale rates with underlying costs. The proposal is designed to help ensure that DER participants pay their share of system costs rather than shifting them to customers who cannot afford DER or otherwise do not choose to pursue it. EA 3.3.2 Alternative B states that the bill impacts for large commercial and industrial consumers would be expected to fall within a range of a 2 percent decrease to a 5 percent increase. The implementation of the charge to improve fixed cost recovery from consumers with contract demands greater than 5,000 kW would be revenue neutral for TVA and would be implemented in October 2019. TVA is continuing to negotiate with both TVPPA's Rates and Contracts Committee and TVIC to finalize the structures.</p> <p>As presented in Chapter 3 of the EA, the proposed default retail residential rates would increase the cost of energy for the first 1,000 kWh each month. Under the proposed optional rates, the cost of energy would be increased an average of 0.3 percent. Neither of the two proposed retail rate structures would be likely to decrease the incentive for</p>

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			<p>energy efficiency or conservation.</p> <p>The implementation of the proposed wholesale standard service grid access charge would be revenue neutral for the wholesale standard service, wholesale non-standard service, and direct service consumers. It would neither increase nor decrease the costs recovered from those customer classes.</p> <p>There is no "hidden subsidy to large industrial customers"; large manufacturing customers as a class would see an average of almost one percent increase in their effective rates as a result of the proposed rate change due to the proposed reduction in energy rates for large general service customers and the proposed rebalancing of the hydro allocation debits, slightly offset by a tenth of one percent decrease due to the proposed modification of the fuel cost adjustment formula.</p>
93	SACE	<p>The Draft 2018 Rate EA misrepresents TVA's analysis of the impact of the GAC on DER. It is remarkable that TVA finds that nearly all of the environmental, socioeconomic, market and financial effects of its alternatives would be minimal and non-impactful, using terms such as "minor," "negligible," and "slowed marginally" in the Draft 2018 Rate EA. For example, TVA claims that, "under Alternative B, no change in the trend of DER adoption is expected, while under Alternatives C and D, it is expected that the penetration of DER may be slowed marginally." The only effect that TVA appears to find impactful would be the "cost shifting to nonparticipant consumers" due to DER</p>	<p>The commenter is drawing an incorrect conclusion from a large general service class analysis conducted by TVA in 2017 and extrapolating to TVA's entire sales. The cost shifting reference to a reduction of 40% was referring to the large general service rate classes which makes up less than 3% of TVA's total sales. The reduction was premised upon an initial proposal to implement a contract demand for those customers. The rate design for those large customers has not been finalized. Implementation is proposed for October 2019.</p>

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		<p>investment. While neither the level of DER investments nor the amount of “cost shifting” is quantified in the Draft 2018 Rate EA (except as noted above), TVA nonetheless concludes that its preferred alternative (Alternative C) would address the concern of “cost shifting” without having any adverse effects. In contrast, in various “confidential and proprietary” or “privileged” documents, TVA presents a far more aggressive “case for change.” Specifically, TVA expects the number of “economic installations” of on-site solar installations to decrease by about 40% as a result of the recommended rate restructuring. Notably, TVA conducted an analysis that appears to show:</p> <ul style="list-style-type: none">• Wholesale rates changed as recommended in the Draft 2018 Rate EA: Commercial (general service) DER penetration reduced by 20% (e.g., to 80% of the baseline level)• Retail rates changed as recommended by TVA: Commercial DER penetration reduced by 40%• Both Wholesale and Retail rates changed as recommended: Commercial DER penetration reduced by 60% <p>These findings were a core component of TVA’s “case for change,” that strongly contradicts the Draft 2018 Rate EA. Reducing commercial DER penetration by 60% is hardly “slowed marginally.”</p>	<p>See also TVA’s response #91 regarding the analysis behind the asserted “40 percent decrease” in economic installations.</p> <p>TVA has revised the EA to address cost shifting. In the EA, TVA notes that residential rooftop solar penetration of 2% would equate to more than \$54 million dollars annually in shifted cost. Although residential rooftop solar is not the focus of the proposed wholesale rate change, those shifted costs over 10 years would result in over a half billion dollars in inequitably shifted costs. As explained in section 1.1 of the EA, the costs shifted from commercial customers are of greater concern as more commercial customers undertake sustainability initiatives, such as RE100. The number of companies interested in setting renewable energy goals has increased dramatically in recent years, and many of these companies have locations within the TVA service territory. Without appropriate rate structure changes, customer renewable initiatives such as this will unfairly shift costs to non-participants, including residential consumers</p> <p>The EA represents TVA’s analysis of its proposed rate change. This comment (#93) refers to a presentation given by TVA that presented analysis relating solely to large general service customers and the potential for them to recognize savings from the installation of uneconomic on-site solar. See also the response to comment 91.</p>

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94	SACE	<p>It is unclear from TVA's supporting documents whether the ultimate goal of a 40% or 60% reduction in DER investment at commercial facilities is associated with the 1 cent per kWh GAC or the "roadmap" goal of 2.5 cents per kWh. Assuming that the larger reductions are associated with the overall "roadmap" goal, it is clear that the overall purpose of TVA is to substantially deter the development of clean energy resources not undertaken under utility control.</p> <p>As discussed below, the actual impact of the GAC on DER investment will depend on retail rate design. TVA carefully raises this issue without resolving it in the Draft 2018 Rate EA - effectively deferring any actual impacts to future actions that it does not believe to be within the scope of this Draft 2018 Rate EA. In doing so, TVA is repeating a pattern of taking actions at the wholesale level that trigger harmful actions at the retail level, but hiding behind a fig leaf of "uncertainty."</p> <p>It should be evident that deterring DERs would result in less solar generation, energy efficiency and other forms of clean, emission-free DER on TVA's system. Thus, it is highly likely that TVA's proposed actions and overall intent is to maintain fossil fuel generation at a higher level than would be the case if DERs were deployed by customers. This would have substantial air, water, and human health impacts, none of which are adequately analyzed or identified in the Draft 2018 Rate EA.</p>	<p>The intention of the proposed rate change is to reduce the incentive for uneconomic DER rather than to reduce the number of customers who generate renewable energy. The proposal is designed to help ensure that customers who use the grid pay their fair share of the cost of the grid. In addition, the rate proposal is not designed to incentivize additional energy use. TVA's analysis described in the EA demonstrates that there would be little to no impacts to either customer usage or to power generation.</p> <p>The degree to which current energy rates over-incentivize consumer installation of uneconomic DER would only be slightly reduced by the proposed 0.5 cents per kWh reduction in rates and the implementation of a wholesale standard service grid access charge (Alternative C1).</p> <p>TVA has added information into the EA regarding DER investment (see section 3.3), and has concluded that investment in DER would likely be marginally slowed. TVA estimates that the payback period of a typical rooftop solar investment would increase by about one year, from approximately 15 years to 16 years. Literature suggests that this change would not result in a significant change in DER investment. As such, there would be little change in the influence of DER on environmental and socio-economic concerns.</p> <p>Because the analysis does not demonstrate a significant change in energy usage associated with the proposed rate</p>

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			<p>change, the environmental impacts are expected to be indirect, limited, and essentially indiscernible.</p> <p>In the EA, TVA provides analysis of possible effects at retail while responsibly noting that specific effects are outside TVA control. Within its role as the rate regulator for most LPCs, TVA would act to minimize bill impacts to retail customers at described in 2.3.1 of the EA.</p>
95	SACE	<p>The Draft 2018 Rate EA Will Result in Significant Negative Impacts on Residential Customers, Particularly at 2.5 cents per kWh and Retail Fee Increases.</p> <p>TVA's Strategic Pricing Plan "roadmap" demonstrates an intent to eventually implement a Grid Access Charge of at least 2.5 cents per kWh. Furthermore, while TVA proposes that its LPCs could adopt a declining block rate structure to recover the GAC, LPCs are more likely to request further increases in mandatory fees. Yet TVA's explanation of the impacts of its wholesale and retail rates analysis finds identical impacts regardless of whether the GAC is 1.0 or 2.5 cents per kWh, as presented in Tables 5 and 6 of the Draft 2018 Rate EA. TVA either conducted this analysis improperly, or explained it very poorly. One reason that TVA may have limited its analysis to consider only declining block rates is that an increase in customer's monthly mandatory fee would result in greater impacts.</p> <p>Our analysis of TVA's suggested declining block retail rate design resulted in findings that are generally consistent with those listed in the Draft 2018 Rate EA. First, load growth will be largest when TVA raises the GACE level of 2.5 c/kWh and also if LPCs elect to utilize the monthly</p>	<p>This commenter references the information given during a presentation in 2017 (see response #91). TVA was asked by the LPCs what a long term pricing road map might look like under a continuation of current conditions. Given the extent to which wholesale energy prices are above marginal cost, the advancements in technology, and the declining renewable resources, TVA suggested a gradual reduction in energy rates. The slide does not refer to a corresponding increase in the grid access charge, it only refers to energy charge reductions. Moreover, the take away box at the bottom of the slide specifically states "and continuously monitor for mid-course corrections."</p> <p>TVA's analysis revealed that there would no difference in the retail rates under the 0.5 cent scenario (Alternative C1), the 1.0 cent scenario (Alternative C2), and the 2.5 cent scenario (Alternative D) because TVA, as the retail regulator, would propose the same default retail rates for the 0.5 cent scenario, the 1.0 cent scenario, and the 2.5 cent scenario based on our guiding principle of gradualism. TVA's proposal includes Implementing Guidelines to LPCs that would reduce the extent to which</p>

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		mandatory fee rate structure approach instead of declining block rates. Second, increases to mandatory fees will increase disproportionate negative impacts to lower-use residential customers, who tend to be minority or low-income populations. Thus, while TVA concludes that the socioeconomic and environmental impact of the proposed actions are minimal, our analysis comes to a different conclusion. TVA's proposed actions – especially the long-term “roadmap” that it intends to follow – would have substantial socioeconomic and environmental impacts not studied in the Draft 2018 Rate EA.	<p>retail rates could be altered, thereby reducing potential impacts to customers.</p> <p>As the EA states, there are no proposed mandatory retail grid access charges. No disproportionate negative impacts to low-use customers.</p>
96	SACE	Residential rates will also be affected by the proposal to redesign and reduce rates for large commercial (GSA3) customers. In presentations to TVPPA committees, TVA presented potential impacts of the proposed changes for commercial customers using two example LPCs, a “heavy residential” cooperative utility and a “heavy GSA2/3” municipal utility. In July 2017, TVA explained that in order to achieve a reduction in rates for commercial customers, residential rates are increased by 0.7%, either through a roughly \$1 monthly mandatory fee increase, or a 0.1 cent per kWh energy rate increase. It is unclear from TVA's presentation materials why the GSA3 reduction was 8.8% for the example coop, as compared to only 1.0% in reduction for GSA3 customers at the example municipal utility. Yet in the Draft 2018 Rate EA, TVA suggests that the rate impact of this change would be only a 0.3% rate increase to residential customers. We were unable to locate any presentations to TVPPA that support this lower value, but nonetheless have relied upon this figure for purposes of preparing these comments. However, if TVA	<p>The commenter again refers to a portion of a TVA presentation given in 2017 and seems to have misinterpreted the referenced slide. GSA3 customers have contract demands less than 5,000 kW and are small commercial customers rather than “large commercial customers.”</p> <p>The presentation was part of an early discussion regarding GSA3 retail rates relative to cost of service. While the slide demonstrated reductions in GSA3 rates would not produce large bill impacts to other rate classes, formal discussions of default rates did not occur the last quarter of 2017. In those discussions, TVA and TVPPA agreed that the default rates would not include reductions to GSA3 rates and, consequently, no associated impacts to residential and other classes.</p> <p>Further, the analysis the commenter references pertained to a specific LPC rather than the TVA system as a whole.</p>

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		did intend to increase rates by 0.7%, resulting in a potential \$1 monthly mandatory fee increase, then this only increases the potential socioeconomic impact of TVA's rate structure change proposal.	<p>The analysis became obsolete when TVA and TVPPA agreed that the default rates would not include reductions to GSA3 rates.</p> <p>TVA estimates that there would be no shift in costs from small commercial and industrial customers to residential consumers due to the proposed wholesale rate change or with the associated retail rate changes. As stated in the EA, the bill impacts to small commercial and industrial customers would be similar to the residential class bill impacts.</p> <p>TVA has proposed default and optional retail rates for LPCs that do not include retail grid access charges for residential consumers. TVA has not proposed that the wholesale standard service grid access charge be implemented by LPCs at retail as a monthly retail grid access charge.</p>
97	SACE	<p>Our analysis of residential rate impacts focused on three issues: retail rate design (declining block rate vs mandatory fees), demand impacts (rate impacts on residential demand), and commercial rate shifts. As discussed in greater detail in Appendix D, our analysis finds:</p> <ul style="list-style-type: none">• Under Alternative C, with declining block rates, low use customers see a 0.4% decrease in demand, but above-average customers see a 0.4% increase in demand. On average, the demand impact would be lower than the 0.4% increase in overall demand presented in Table 5 of the Draft 2018 Rate EA.	<p>Comment noted. As presented in Table 5 of the EA, TVA expects the impact of the retail rate structure changes to be a 0.04% increase in the combined sales to residential and small commercial and industrial consumers, not a 0.4% increase as stated by the commenter.</p> <p>The commenter is mistaken that "Under Alternative D. . . customer demand is increased (or decreased) by more than double that in Alternative C." TVA has proposed in its Implementing Guidelines the same declining block rate for default retail residential customers under Alternatives</p>

#	COMMENTS	COMMENT STATEMENT OR SUMMARY OF STATEMENTS	TVA RESPONSE
		<ul style="list-style-type: none">• Under Alternative D, with declining block rates, customer demand is increased (or decreased) by more than double that in Alternative C. On average, this would be 0.3%, a value that is similar to that presented TVA's result shown in Table 6 of the Draft 2018 Rate EA. Notably, this would undo the last year of TVA's energy efficiency programs.• Under Alternative C, with increased monthly mandatory fees, customer demand increases for all customers by 1.6%. Notably, this would undo about four years of TVA's energy efficiency program efforts with one single policy action.• Under Alternative D, with increased monthly mandatory fees, customer demand increases for all customers by about 4.0%. Notably, this would undo all of TVA's historical and planned energy efficiency program efforts through 2025 with one single policy action.• Because the weight of the evidence suggests that Alternative D with increased monthly mandatory fees is a very probable outcome within just a few years, TVA should analyze the potential socioeconomic and environmental impacts of such a policy change.	<p>C1, C2, and D. Under each alternative, the rate for the initial 1,000 kWh each month would be increased by \$0.002 per kWh while the rate for usage in excess of 1,000 kWh would be decreased by an average of \$0.005 per kWh. Regardless of which alternative might be selected for the wholesale standard service grid access charge, TVA would design default retail rates to minimize the impacts to retail customers.</p> <p>The commenter is mistaken that "Under Alternative C, with increased monthly mandatory fees, customer demand increases for all customers by 1.6%." TVA has not proposed that the wholesale standard service grid access charge be implemented by LPCs at retail as a monthly retail grid access charge. If an LPC elects to implement customized rates that include a retail grid access charge, the rates would have to have a definitive cost basis.</p> <p>Furthermore, as described in the EA, TVA would limit the retail customer impacts. Under the preferred alternative, Alternative C1, TVA would generally limit a retail grid access charge for residential customers to a maximum of \$4 per customer per month, with a commensurate reduction in energy rates, applicable to higher use customers, and phased in over multiple years. Generally, the maximum retail grid access charge for residential customers would be \$6 under Alternative C2 (EA 2.4.1). Consequently, there would be no dramatic decrease in effective residential energy rates and, therefore, no significant increase in residential customer usage. As</p>

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			<p>detailed in the EA Table 5, the expected increase in residential usage attributable to changes in retail rate structures is about 31 million kWh or 0.05%.</p> <p>The commenter is mistaken that "Under Alternative D, with increased monthly mandatory fees, customer demand increases for all customers by about 4.0%." TVA has not proposed that the wholesale standard service grid access charge be implemented by LPCs at retail as a monthly retail grid access charge. If an LPC elects to implement customized rates that include a retail grid access charge, the rates would have to have a definitive cost basis. Furthermore, under Alternative D , TVA would limit the retail customer impacts. TVA would generally limit a retail grid access charge for residential customers to a maximum of \$20 per customer per month, with a commensurate reduction in energy rates, applicable to higher use customers, and phased in over multiple years. Consequently, there would be no dramatic decrease in effective residential energy rates and, therefore, no significant increase in residential customer usage. As detailed in the EA Table 6, the expected increase in residential usage attributable to changes in retail rate structures is about 31 million kWh or 0.05%.</p> <p>As stated both above and in the EA, TVA is not proposing retail grid access charges. To the extent that LPCs elect to implement retail residential grid access charges, TVA would limit the impacts to retail customers. It is premature to speculate on either the timing or magnitude of any</p>

#	COMMENTS(s)	COMMENT STATEMENT OR SUMMARY OF STATEMENTS	TVA RESPONSE
			future rate changes.
98	SACE	The Draft 2018 Rate EA lacks analysis of the concept of declining block rates. According to the Regulatory Assistance Project, “[t]he cost of producing energy does not decline as usage increases. Long-run marginal costs are increasing, not decreasing, as utilities rely on lower-emission, higher-cost new resources. Higher consumption levels also introduce several distinct environmental costs. Declining block rates – where consumers pay less per kWh at higher levels of energy usage – send exactly the wrong price signal.” In other words, declining block rates are contrary to TVA’s stated intent to align retail rates with costs. This is unsurprising, since one of the main reasons TVA prefers declining block rates is that it would help “counter residential DER.	Contrary to the commenter’s assumptions, TVA does not provide customers with energy-only service; and with the exception of about 60 directly served customers, TVA does not provide any service to retail customers. TVA provides a variety of interrelated services at wholesale to local power companies, including capacity, transmission, ancillary services, and energy. In designing the proposed default retail rates, TVA must ensure the local power companies’ retail rates provide adequate retail revenue to recover their wholesale power costs and their distribution operations and maintenance costs. The proposed default retail rates collect some of the proposed wholesale standard service grid access charge through a slightly declining block rate in the first 1,000 kWh used rather than spreading it evenly across all kWh used. In designing the proposed default retail rate, TVA relied heavily on its guiding principles--in particular, the principle of minimizing bill impacts to all customers. The proposed default retail rates include a declining block rate structure that would have the best overall fit for competing retail objectives, including minimizing bill impacts (especially to low use customers), not requiring additional metering and billing systems infrastructure, being easy to understand, and, most importantly, providing bill stability to customers through the transition.
99	State of Tennessee Department of Environment and Conservation	TDEC encourages TVA to evaluate what a pass through increase to large general service rates will mean for residential consumers’ household expenses. TDEC recommends that TVA include additional research,	As described in EA 2.2.1, General Service Rates for Large Customers, TVA proposes to decrease rates by \$23 million (approximately 8%) for the large general service customers, which include 9 federal government facilities,

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		<p>discussion, and analysis of the associated indirect impacts to residential customers from any increase in the large general service commercial rates, which will increase annual operating expenses to critical infrastructure such as hospitals, municipal buildings, and water and wastewater treatment plants in the Final EA.</p> <p>For instance, drinking water and wastewater treatment systems account for roughly four percent of energy use in the United States. At the local level, almost 35 percent of municipal energy use occurs at water and wastewater treatment plants, as the pumps, motors and other equipment used to treat water often operate around the clock. The high energy intensity of these facilities accounts for 25 to 50 percent of the operating budget for wastewater utilities and 80 percent of the processing and distribution costs for drinking water treatment plants. This increased annual expense may lead to further deferred maintenance to an already strained infrastructure system of pipes and treatment facilities.</p>	<p>15 universities, 12 hospitals, 10 water and sewer systems, 2 airports, and 1 prison.</p> <p>As described in the EA, other components of the proposed rate change will also have impacts on the rates for large general service customers. The implementation of a fixed charge proposed for October 2019 (EA 2.2.1 Wholesale Non-Standard Service) would be revenue neutral for TVA but would have a range of effects on individual customer bills, ranging from a 2 percent decrease to a 5 percent increase. The effect for a particular customer would depend upon the final rate structure agreed upon by TVA, TVPPA, and TVIC as well as the usage profile of the customer. The rebalancing of the hydro allocation debits (EA 2.2.2 Hydro Preference Allocation Rebalancing) will increase the rates for all nonresidential customers slightly. The increase for large general service rates would be approximately 0.6 percent. The modification of the fuel cost adjustment formula (EA 2.2.1 Total Monthly Fuel Charge) would increase the effective rates for large general service customers by 0.3 percent. Taken as a whole, the proposed rate change would result in an expected net decrease in large general service rates ranging from 2 to 9 percent.</p> <p>TVA's analysis (Tables 7, 8, and 9) indicates that there would likely be no significant changes to usage by large general service customers as a result of the proposed rate change.</p>

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100	G. Ginsberg, G. Wathen, G. Miller	<p>Concerns regarding the adverse impacts to participants in the Green Generation Partners program and to those who current own DER, including the following statements:</p> <p>-Those invested in solar for TVA's Green Generation Partners will be adversely affected because the GAC would mean lower compensation to solar power generation partners.</p> <p>-My wife and I are investing thousands of dollars into clean energy production, and entered into our agreement to participate in TVA's Green Power Plan in good faith, that we would be reimbursed for the energy that I produce at the prevailing rate that TVA charges for the next 20 years. Now it appears that TVA wants to penalize those efforts by raising their fixed costs for accessing the electrical grid while reducing the wholesale rate that it charges to local utility providers.</p> <p>-The proposal would economically punish those who consume no power from TVA, but are still tied to the grid (as is required by county government to obtain a residential building permit).</p>	<p>In the EA, TVA found that under Alternative B, no change in the trend of DER adoption is expected, while under Alternatives C1, C2 and D, it is expected that the penetration of DER may be slowed marginally because of minor adverse effects on the return of investments in DER. Despite this marginal effect of making the payback period for DER slightly longer, TVA found in its analysis that the proposed rate change is unlikely to influence the rate of investment in DER among retail consumers.</p> <p>TVA also notes that for existing DER investments where rates are specified by contract (such as in TVA's Green Power Providers [GPP] or Generation Partners [GP] programs), the time for those investments to break even would not be affected by the rate change.</p> <p>TVA is unaware of consumers still tied to the TVA grid who consume no TVA power. Unless a consumer has an energy storage system, consumers with GPP or GP generation actually consume TVA power at night or at low-wind times, even if their total generation exceeds their total consumption.</p>

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101	Southern Current (Hamilton Davis)	<p>We are concerned with TVA's failure to demonstrate either the existence or scale of any potential intra-class cost shifting that might result from increased adoption of DERs. TVA fails to quantify any theoretical negative impacts of expanded DER adoption to non-DER customers under the current rate structure. It also fails to demonstrate how the proposed rate changes would obviate those impacts. A number of recent national and regional studies that include more detailed analyses of these issues have conclusions that are in conflict with the claims made by TVA.</p> <p>1 Putting the Potential Rate Impacts of Solar into Context, https://emp.lbl.gov/sites/all/files/lbnl-1007060.pdf</p> <p>2 Efficiency, DERs saving \$2.6 billion dollars in avoided transmission costs, CAISO says, https://www.utilitydive.com/news/efficiency-ders-saving-26b-in-avoided-transmission-costs-caiso-says/519935/</p> <p>3 Draft load forecast indicates energy usage and peak demand will decline slightly over the next 10 years, http://isonewswire.com/updates/2018/3/29/draft-load-forecast-indicates-energy-usage-and-peak-demand-w.html</p>	<p>See TVA's responses above to comments on the occurrence of cost-shifting related to DER. TVA reviewed the three sources referenced by the commenter and found that they do not support the assertion that TVA's valuation of DER is inaccurate, incomplete, or inequitable.</p> <p>The first study cited by the commenter is a paper published by the Lawrence Berkeley National Laboratory (LBNL). This study presents "illustrative comparisons between the effects of distributed solar and other drivers of retail electricity prices." The paper does not address distributed energy resources, provide state- or utility-specific analysis, support any particular approach to defining the value of solar, or provide a cost-benefit analysis of distributed solar or any other type of policy or resource. Because of these limitations, the LBNL paper is more theoretical than practical.</p> <p>The second study, apparently an internet news item, pertains to transmission project decisions made in California which were attributed by the California Independent System Operator (CAISO) to be "driven by energy efficiency programs and increasing levels of residential, rooftop solar generation." However, the decisions were made as recently as a month ago and there is no data to confirm the role the various drivers played in the decision, nor any indication that the project decisions are permanent. Because it is focused solely on California and because it does not present evidence that the delayed costs have actually been avoided, the article</p>

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			<p>is not helpful when evaluating TVA's proposed wholesale rate change.</p> <p>The third item referenced is also an internet article providing an update of ISO New England's annual long range energy forecast for its region. Because its focus is exclusively the territory of ISO New England, the internet story is not relevant to the patterns of energy usage or peak demand in TVA's service area or to TVA's proposed wholesale rate change.</p>
104	State of Tennessee Department of Environment and Conservation	<p>TDEC commends TVA for maintaining one of the most reliable transmission and generation systems in the country. However, certain commercial consumers need an extra layer of reliability and resiliency to blackouts; these critical infrastructure facilities include datacenters, water and wastewater treatment plants, emergency operations centers, and hospitals. These facilities already have backup generators and are now, after frequent severe storm events, looking to reinforce their resiliency with additional onsite generation and storage including solar, batteries, and micro combined heat and power (CHP). The economic benefit of a reliable, black-start-capable DER such as CHP or solar-battery systems, often paired with a microgrid, should be considered, evaluated, and even encouraged by TVA. Innovative ownership and funding models have developed around the country whereby utilities or their LPCs partner with customers to own and/or operate microgrid DER. By reducing energy rates and</p>	<p>When proposing rate structures, TVA seeks to establish rates that collect revenues in proportion to costs incurred to serve those customer classes and seeks to establish rates that are both as low as feasible and competitive.</p> <p>The rate change proposal under consideration is not intended to address resiliency and reliability issues for certain customers. The small magnitude of the rate change makes it unlikely that the proposal would discourage the development of these DER systems.</p>

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		increasing fixed fees, the economics of microgrids and reliability projects become more burdensome for mission-critical customers. TDEC encourages TVA to provide discussion on these points in the Final EA.	
105	K. Beaty, S. Brendel, L. Burch, C. Burch, D. Burgess, E. Burgess, F. Burgess, K. Carey Jr, T. Case, T. Case, S. Chamberlin, S. Chilton, DB Clark, JD Clark, J. Conner, K. Cook, G&S Cook, S. Creers, W. Daugherty, E. Denton, V. Dixon, M. Dryja, D. Dunn, AJ Dwenger, J. Dwenger, T. Echols, B. Everett, G. Ford, A. Fusco, B. Grisham, M. Gulick, C. Henry, C. Hoover, B. Jenkins, T. Jones, J. Jones, M. Lammers, R. Lamonda, E. Larson, N. Lee, J. Lee, L. Mallory-Elliott, D. Matheny, J. McCoy, P. McCoy, L. McKenna, A. Miller, D. Neilson, D. Nelson, S. Parris, R. Paxton, S. Peeples, R. Peeples, M. Pendergrass, K. Phillips, W. Rabert, J. Reed, A. Reels, P. Robbennolt, J. Settlemeyer, B. Smith, J. Smith, A. Storic, R. Storic, R. Storic, H. Hivus, E. Turner, M. Vogel, G. Whitehead, S. Wyatt, S. York, B&A York, G. Ziegele, and J. Ziegele	<p>Commenters from the Volunteer Energy Cooperative provided the following statements:</p> <p>The grid access charge will be applied as an additional fee on the first 1,000kWh of monthly usage at a rate of \$0.002 per kWh. This is in addition to the standard rate already being charged. Although I may get a credit of \$0.00498/kWh after 1,000kWh, I will have to use at least 1,402 kWh before I can break even.</p>	<p>The manner in which the proposed rate change would be implemented by each LPC is largely at the LPC's discretion, subject to TVA oversight. TVA has proposed default retail rates that employ a declining block structure and has proposed optional retail rates that use current LPC retail rate structures. However, LPCs may choose to implement the proposed wholesale rate change using a variety of retail rate structures, including retail grid access charges.</p> <p>The values used in the EA analysis were system averages rather than specific to an LPC, such as the Volunteer Energy Cooperative. The declining block rate design was developed as a default design for several reasons, including the reasons that such a design would minimize increases to all customers (especially low use customers) and reduce bills associated with high seasonal usage. TVA notes that while the average monthly residential usage is around 1,200 kWh, the average monthly summer residential usage is 1,450 kWh and that the maximum monthly increase to monthly consumer bills identified in TVA's analysis of the proposed default retail residential rates is \$2.</p>

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106	K. Beaty, S. Brendel, L. Burch, C. Burch, D. Burgess, E. Burgess, F. Burgess, K. Carey Jr, T. Case, T. Case, S. Chamberlin, S. Chilton, DB Clark, JD Clark, J. Conner, K. Cook, G&S Cook, S. Creers, W. Daugherty, E. Denton, V. Dixon, M. Dryja, D. Dunn, AJ Dwenger, J. Dwenger, T. Echols, B. Everett, G. Ford, A. Fusco, B. Grisham, M. Gulick, C. Henry, C. Hoover, B. Jenkins, T. Jones, J. Jones, M. Lammers, R. Lamonda, E. Larson, N. Lee, J. Lee, L. Mallory-Elliott, D. Matheny, J. McCoy, P. McCoy, L. McKenna, A. Miller, D. Neilson, D. Nelson, S. Parris, R. Paxton, S. Peeples, R. Peeples, M. Pendergrass, K. Phillips, W. Rabert, J. Reed, A. Reels, P. Robbennolt, J. Settlemeyer, B. Smith, J. Smith, A. Storic, R. Storic, R. Storic, H. Hivus, E. Turner, M. Vogel, G. Whitehead, S. Wyatt, S. York, B&A York, G. Ziegele, and J. Ziegele	<p>Commenters from the Volunteer Energy Cooperative also provided the following statements:</p> <p>To complicate matters, under the proposal, a 1% grid access charge premium on all kilowatt-hours sold would be applied. I estimate the effect of these charges on smaller accounts to be an increase of between 2.0 and 2.5% on each month's electric bill. This is in addition to the 1.5% rate increase that TVA plans to apply in October. The rate is going to increase between 3.5% and 5% in total on most residential bills.</p>	<p>See response #105 for a description of the proposed default retail rates and the proposed optional retail rates.</p> <p>The maximum rate impact percentage, or "risk premium" is the maximum annual bill impact by LPC for the fiscal years 2013 through 2017. The impact adjustments do not represent additional revenue for TVA.</p> <p>The maximum rate impact percentage would be available to LPCs that choose to implement the proposed optional retail rates. The risk premium would not be applied to the declining block rates included in the proposed default retail rates. Individual LPCs would make the determination whether to implement rates reflecting their maximum rate impact percentage. TVA is not recommending that such premiums be applied.</p> <p>The EA 2.3.1 provides more detail on how the risk premium would be calculated. The risk premiums for the LPCs would range from 0.04 percent and 0.78 percent; the average risk premium would be 0.3 percent.</p> <p>As stated above, TVA's analysis of the proposed rate change showed that consumers' monthly bills would not increase more than \$2 from the proposed default rates. Some consumers would not be affected in this manner, however. As shown in the EA, the monthly electric bills for many consumers are projected to decrease under the proposed rate change. For low-volume users, minor or no</p>

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			<p>increases may occur for any month with higher usage (such as in summer or winter).</p> <p>The cumulative effect of the various rate change components on residential customers of LPCs electing the proposed optional retail rates would range from 0.34% to 1.08% and would average 0.6%.</p> <p>Assuming hypothetically that an LPC was to apply the default rates and that TVA was to have a separate rate action in October 2018 (such as a 1.5% rate adjustment at retail suggested in the comment), the combined effect of the increase would be 1.8% overall to residential customers, with an additional 2% at most in any month for lower usage customers. This is based on the 0.3% increase related to the large general service plus the hypothetical 1.5% rate adjustment.</p> <p>Assuming hypothetically that an LPC was to apply the optional rates and that TVA was to have a separate rate action in October 2018 (such as a 1.5% rate adjustment at retail suggested in the comment), the combined effect of the increase would be, on average, 2.1% overall to residential customers. This is based on the 0.3% increase related to the large general service plus the 0.3% average risk premium plus the hypothetical 1.5% rate adjustment.</p>
107	M. Briggs, L. Heidkamp, M. Walton	Commenters expressed concern that the grid access charges would result in permanent loss of revenue because people will bypass or leave the grid entirely.	The proposed wholesale standard service grid access charge is unlikely to result in significant changes to the number customers accessing the grid. Depending on the

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		<p>Sample statements include:</p> <ul style="list-style-type: none"> -The proposal will lead to people going off the grid, which will be a permanent loss of revenue for grid-based energy. (- Adding a grid access charge will increase revenue in the short term, but I believe it will encourage people to find a way to bypass the local electric grid entirely. - If higher grid connection and fixed rates are imposed on users with access to internal or external financing that want to install on-site renewable energy, and the cost of energy storage continues to fall, the long-term result of the rate change will not be more fair sharing of the cost of providing and maintaining the grid, it will be to encourage users to abandon the grid completely. Rather, we should provide incentives to businesses that install renewable energy to install storage and keep it tied to grid so that it can be leveraged as a distributed generation resource and reduce the total cost to serve all customers. 	<p>manner in which a local power company elects to recover the cost of the wholesale standard service grid access charge, residential consumers may experience a small increase in their monthly electric bills. This change would not exceed \$2 if a local power company elects to implement the default retail rates proposed by TVA. This change would not exceed 0.8% if a local power company elects to implement the optional retail rates developed by TVA. If a local power company elects to implement customized rates, for TVA to approve such LPC rates, they must have a definitive cost basis.</p> <p>The analysis of the elasticities in the EA is based on the assumption that LPCs would elect to implement the default rates; this analysis demonstrated that the expected effect of the proposed grid access charge would be a de minimis increase in sales. Further, contrary to the commenters' assertion, the grid access charge would not "increase revenue in the short term." TVA's rate change proposal is revenue neutral.</p>
108	State of Tennessee Department of Environment and Conservation	TVA should provide more information supporting the argument that: "Alternatives C and D would likely have the beneficial effect of lowering households' bills in months of high usage (i.e., summer and winter), therefore helping to stabilize bills from fluctuations due to seasonal variation in weather. This would be more beneficial for low-income households, for whom variations in bills due to season or weather are more likely to cause a problem than for other households." This analysis is incomplete; TDEC recommends that TVA provide more documentation supporting this argument in the Final EA and how the	In the EA, TVA states that more stable bills would be a benefit compared to less stable bills, all else equal, and that bill stability provides more benefit for low-income households than other households. TVA notes that, as with all impacts discussed, this benefit would likely be marginal because the changes in rates are marginal. TVA does not claim that more stable bills would necessarily offset the negative impacts of any small increase in bills. TVA has clarified the language in the EA.

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		overall price increase is expected to impact low-income customers.	
109	State of Tennessee Department of Environment and Conservation	The table on page 28 outlines the potential monthly costs of several electricity usage scenarios under Alternative C, TVA's preferred alternative. Based on these scenarios, the price of electricity per kWh decreases when more energy is used. While lower electricity usage customers may self-mitigate higher costs through adjusting energy usage in response (as is discussed on page 29), this rate structure would incentivize higher energy usage. TDEC encourages TVA to include discussion as to how the proposed rate changes may impact uptake of energy efficiency by residential customers in the Final EA.	As noted in the EA, the expected effects of the proposed default retail rates on usage would be minimal. TVA's analysis of the effects of the small increase in electric rates for the first 1,000 kWh each month and the small decrease in electric rates for usage in excess of 1,000 kWh indicates that such small increases or decreases would not alter customer behavior. Consequently, customers would continue to have nearly the same degree of incentive for energy efficiency and conservation as they have under the current rate structure.
110	Sierra Club/SELC	Under the narrow range of alternatives considered, a user of DER is treated identically as, say, a person who happens to be quite economical in their energy use, a person who has invested heavily in energy efficient appliances, or a poor household who uses very little electricity because they cannot afford it. Because TVA fails to consider any alternative that would differentiate among such users, there is no analysis in the Draft EA of the different socioeconomic and environmental impacts that would flow from rate restructuring strategies to more effectively target the concerns with DER TVA claims to have.	TVA evaluated the impacts of a reasonable range of alternatives while assessing the impacts of the proposed rate change. The wholesale power contract between TVA and its local power companies prohibits special waivers or considerations for certain customers within a given rate class. It states, "the power purchased hereunder shall be sold and distributed to the ultimate consumer without discrimination among consumers of the same class, and that no discriminatory rate, rebate, or other special concession will be made or given to any consumer, directly or indirectly." Setting design rates based on considerations identified by commenters would result in discrimination in favor of certain consumers and against certain other electric consumers, contrary to the wholesale power contract. Importantly, setting design rates based on these considerations does not satisfy the purpose and

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			need of the proposal, which is to align wholesale rates with the underlying costs.
111	Center for Biological Diversity	The EA asserts – again, with no substantiation – that additional DER investment will “reduce the future incentive for utility-scale investment in renewable energy generation.” EA at 25. In particular, TVA claims that since additional DER reduces demand for additional central generation, this means less demand for utility-scale solar. Id. However, since it is just as likely that additional generation will come from other power sources – including coal and natural gas – this assumption also makes no sense. It also ignores the benefits of DER over utility-scale solar, including lower line losses, and avoided wildlife mortality and avoided land use and land cover change from both transmission and siting of utility-scale solar plants. Again, TVA simply cannot justify the need to imposed mandatory fees on such illogical and unsupported premises.	<p>The commenter incorrectly asserts "it is just as likely that additional generation will come from other power sources – including coal and natural gas." The 2015 IRP included plans for expanded energy efficiency and solar generation. The 2015 IRP indicated that the retirement of some existing coal-fired generation is likely while the addition of new coal-fired generation is unlikely.</p> <p>As noted in the Lazard’s Levelized Cost of Energy Analysis (2017), the estimated cost of utility-scale solar ranges from \$43 to \$53 per MWh contrasting with residential rooftop solar ranges of \$187 to \$319 per MWh, demonstrating that residential rooftop solar generation remains uneconomic when compared to utility-scale solar generation. Other benefits like reduced line losses are very small compared to total costs.</p> <p>TVA has not proposed mandatory fees as a way to address retail rate designs. As noted in the EA, TVA has proposed default and optional retail rates for LPCs that do not include retail grid access charges for residential consumers. This approach largely maintains the LPCs’ current volumetric retail rate structures.</p>
112	SACE	In addition to misdirecting readers to focus mainly on solar DER generation to the exclusion of other DERs like energy efficiency, the Draft 2018 Rate EA creates a misleading	Please see TVA’s responses to comments regarding cost shifting above (response #22).

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		<p>impression of potential impacts. Nowhere does TVA estimate the degree to which its preferred alternative would mitigate the alleged cost shifting caused by DER adoption. The Draft 2018 Rate EA includes the statement that “2 percent of its customers are likely to install solar photovoltaic systems by 2030,” but does not provide the analysis used to reach that figure. This number is somewhat greater than the figure reported in the 2015 IRP.</p> <p>In contrast to this “2 percent” figure, in discussions with the LPCs, TVA suggests that the potential impact is about 5% of total generation and retail revenue before fuel. In several presentations to TVPPA committees, TVA claimed that non-fuel revenue loss could be up to \$500 million if the known corporate and federal renewable energy goals are met, which would represent over 5% of the TVA system’s total retail revenue before fuel. [Footnote: TVA’s total retail revenue before fuel is about \$9.7 billion. Source: TVA, presentation to TVPPA Rates & Contracts Committee (August 3, 2017), slide 63.] This suggests that TVA expects its large users to be the majority of DER adopters, however this is difficult to assess without more information about the analysis TVA used to get these figures.</p> <p>Taken at face value, the Draft 2018 Rate EA states that demand and DER adoption will not be significantly affected by its proposed actions. If that is the case, it should be relatively straightforward to estimate the amount of cost shifting that will occur under the no action</p>	<p>Upon review of this comment, TVA found that the statement from the draft EA cited by the commenter (“TVA estimates that 2 percent of its customers are likely to install solar photovoltaic systems by 2030” on page 31 of the draft EA”) is incorrect. The 2 percent estimate pertains only to residential customers, not all TVA customers. Section 3.4.1 of the final EA has been revised to correct this error. This figure was derived by TVA forecasters and planners.</p> <p>TVA’s cost of service analysis presented in Appendix C of the EA details the 72 percent of TVA expenses that are classified as fixed costs. The proposed rate change would recover approximately \$0.6 billion (about 8 percent) of nearly \$7.8 billion of fixed costs through the wholesale standard service grid access charge. As described in the EA, the proposed rate change would not have a measurable impact on demand. As acknowledged in the EA 2.3.1, although TVA has proposed default retail rates that employ a declining block structure and has proposed optional retail rates that use current LPC retail rate structures, LPCs may choose to implement the proposed wholesale rate change using a variety of retail rate structures, including retail grid access charges. The EA explicitly states that TVA would “limit the amount of revenue recovery allocated to any single retail rate class and the amount of rate increase for any single customer within that retail rate class.</p>

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		<p>alternative, and to what degree the other alternatives would reduce this cost shifting. The fact that TVA has not presented any such findings, but has clearly conducted such analysis, strongly suggests that TVA intends to move forward regardless of whether its policies have an impact on DER adoption.</p> <p>In summary, TVA's Draft 2018 Rate EA indicates that the GAC and associated retail rate structure changes are a response to a 2% penetration rate of vaguely defined and inadequately quantified DER generation resources. However, other documents not included as part of this NEPA process indicate that TVA's actual concern is a potential 5% penetration rate of solar DER generation installed on-site at large commercial and federal government facilities. In addition, other proposed actions in the Draft 2018 Rate EA would perpetuate and expand a hidden subsidy to large industrial customers.</p>	<p>It is not inconsistent to forecast that 2 percent of households will have DER installations and to estimate a potential impact of a different percentage to total generation. The 2 percent refers to the number of retail residential customers expected to deploy solar by 2030. Any estimated impacts on total generation would also include impacts to small commercial and industrial customers served by LPCs, to large commercial and industrial customers served by either LPCs or directly by TVA. The slide referenced by the commenter (used during discussion with LPCs) does not portray any expected level of impact but, rather, is illustrative of potential impacts of DER for a subset of customers. See response #91. As noted on the referenced slide, the TVA's expectation is that "not all of these customers will choose to bypass." Further, the slide does not portray all customers.</p> <p>TVA notes that the \$9.7 billion figure referenced by the commenter as "TVA's total retail revenue before fuel" is not TVA's revenue but the net combined revenues of the LPCs and TVA.</p>

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113	SACE	TVA's NEPA analysis is inadequate. Mandatory fees are misaligned with costs and have undesirable impacts on energy demand. ...while TVA featured its interest in promoting declining block rates for residential customers, it is more probable that the GAC will be implemented using mandatory fees, at least in part. Based on our analysis, if TVA's proposed GAC is converted into retail increase mandatory fees, the average customer would be billed an additional charge of \$12.12 per month. This would represent a 71% increase over an average we estimate at \$17.12/month currently to \$29.24/month per residential customer.	As noted above, TVA presents its cost of service analysis in Appendix C of the EA. The Cost of Service study details the large percentage of TVA expenses that are classified as fixed costs. The proposed rate change would recover approximately \$0.6 billion of nearly \$7.8 billion of fixed costs through the wholesale standard service grid access charge. As described in the EA, the proposed rate change would not have a measurable impact on demand. As acknowledged in the EA 2.3.1, although TVA has proposed default retail rates that employ a declining block structure and has proposed optional retail rates that use current LPC retail rate structures, LPCs may choose to implement the proposed wholesale rate change using a variety of retail rate structures, including retail grid access charges. In section 2.3.1, the EA explicitly states that TVA would "limit the amount of revenue recovery allocated to any single retail rate class and the amount of rate increase for any single customer within that retail rate class." The implementing guidelines would preclude charges of the sort postulated by the commenter.
114	SACE	The impacts are also uncertain because TVA has never produced a clear analysis of the impacts of recent rate structure changes implemented under its Strategic Pricing Plan. TVA enhances this uncertainty by failing to provide details such as the new Fuel Cost Adjustment method and the proposed "rebalancing" hydro allocation credits. TVA states that the "exact amounts of the rebalancing cannot be determined until after June 30, 2018." Ignoring already existing compounding factors, and then proposing additional changes that will further compound deleterious effects on ratepayers without analysis, because such	<p>Details of the current Fuel Cost Adjustment are presented in 2.1.1 of the EA. A description of the proposed change to the Fuel Cost Adjustment is presented in 2.2.1 of the EA. The effects of the proposed change to the Fuel Cost Adjustment are presented in 3.3.2 Alternative B of the EA.</p> <p>As noted in the Executive Summary of the EA, the rebalancing of the hydro allocation credits and debits is not part of the wholesale rate change but is provided for under the current wholesale rate schedule. Details of the hydro</p>

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		analysis is "too difficult," does not alleviate TVA from its responsibilities under NEPA.	allocation methodology and the proposed rebalancing are presented in 2.1.2 of the EA. As stated in 2.2.2 of the EA, the exact amounts of the rebalancing can not be determined until after June 30, 2018. Specifically, the rate schedule requires that the rebalancing be implemented effective October 1 and that the computation be based on the latest 12-month period ending June 30. Therefore, it is impossible to calculate the adjustment prior to June 30, 2018. In the EA, TVA did, however, provided an estimate that there would be "minimal change to the distribution of credits to residential consumers and a \$30 million to \$40 million increase in the collection of debits from nonresidential consumers." Consequently, there are no expected effects for retail residential ratepayers and an estimated average increase of approximately 0.6 percent for all nonresidential customers.
VII. ENVIRONMENTAL IMPACT ANALYSIS			
115	Center for Biological Diversity	Summary of discussion (pp. 12-15): The "primary objective" of the proposal is to increase the charges paid by DER customers in TVA's service territory. With approximately 4 million households served by TVA, the proposal will add mandatory fees of \$300 on average per year to each household, regardless of their energy usage. For those considering investing in distributed energy systems, this lost savings will inevitably turn many of them away from such an approach, given that these added costs will add years to the time necessary for them to recoup that investment. TVA's mandatory fees threaten to dramatically decrease DER investment in the region. In	<p>TVA's underlying need for the proposal is not "to increase the charges paid by DER customers in TVA's service territory." Rather, TVA's primary objectives "are to better align wholesale rates with their underlying costs to serve and to facilitate measured, managed change for retail customers." (EA page 1).</p> <p>First, the analysis provided by the commenter is inaccurate. The \$1.2 billion of costs that TVA proposes under Alternative C2 to recover in wholesale standard service grid access charges would not be borne solely by residential customers (of which there are approximately</p>

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		<p>addition, TVA's proposal would also make electricity less expensive for those who use more electricity, thereby rewarding consumers for using more electricity. The decrease in DER investment and increase in electricity consumption increase power generation, almost 50% of which comes from "dirty" coal and natural gas generation. Therefore, TVA must evaluate the environmental impacts associated with increased reliance on coal and natural gas likely to result from this action. This includes not only the increased amount of and exposure to air pollutants, but also the increased release of GHGs and associated impacts on climate change. The analysis must also include the construction and maintenance of existing and new fossil fuel power plants and the "lock in" effect of such capital-intensive projects that have multi-decade lifespans and inherently commit energy portfolios to dirty energy sources in the long-term.</p>	<p>4,000,000). Rather, the \$1.2 billion that TVA proposes under Alternative C2 to collect from LPCs as grid access charges would be allocated to each LPC's "retail classes based on each retail class's contribution to the LPC's historic sales." See section 2.3.1 of the EA. (Note: TVA's preferred alternative in the Final EA is Alternative C1, 0.5 cents per kWh). In 2017, LPCs sold approximately 52 percent of their standard service power purchases to residential customers and approximately 48 percent to small commercial and industrial customers. Consequently, approximately \$624 million of the proposed grid access charge would be allocated to residential consumers in the Valley. The remaining \$576 million would be allocated to small commercial and industrial consumers. The numbers would be reduced by half for Alternative C1, TVA's preferred alternative in the Final EA.</p> <p>Second, the \$1.2 billion of fixed costs that TVA proposes (Alternative C2) to recover in grid access charges would not be "added costs." Under Alternative C1, preferred by TVA, the wholesale rate proposal is to reduce energy rates for wholesale standard service sold to LPCs by 0.5 cents per kWh (\$600 million) and to implement a monthly grid access charge of 0.5 cents per the LPC's five-year monthly average standard service kWh usage (also \$600 million). The fixed costs recovered through wholesale standard service grid access charges would be offset by the reduction in wholesale standard service energy charges. TVA would receive no additional revenue if the proposal is implemented.</p>

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			<p>Third, the proposed wholesale standard service grid access charges would not be “a mandatory fee paid by residential customers regardless of their energy usage.” As part of the rate change proposal, TVA has designed proposed default resale rates for each LPC. The proposed default retail rates do not include grid access charges or additional fixed charges for residential consumers. As described in section 2.3.1 of the EA, the proposed default rates for residential customers would recover the wholesale grid access charges by means of a slightly declining block rate: "The proposed default rates would provide for no change to the monthly customer charge, a 0.2 cents increase in the existing energy rate for both the first 500 kWh and second 500 kWh consumed in a month, and a slight decrease in the existing energy rate for electricity over 1,000 kWh in a month."</p> <p>Further, TVA has proposed optional retail rates for each LPC based on the resale rate structure currently in place for each LPC. Consequently, these optional rates do not include grid access charges or additional fixed charges for residential consumers (section 2.3.1). Existing rates would be adjusted by an average of 0.3 percent to provide the LPC with a small amount of additional power cost recovery to ensure adequate revenue in the event of lower than average sales.</p> <p>As noted in section 2.3.1, LPCs would be able to propose their own rate structures and retail rate designs, subject to the retail rate review process established by the TVA Board in August 2014. It is possible that LPCs could</p>

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			<p>propose resale rate structures that include retail grid access charges. However, under the preferred alternative, Alternative C1 (EA 2.3.1), TVA would generally limit a retail grid access charge for residential customers to a maximum of \$4 per customer per month, with a commensurate reduction in energy rates, applicable to higher use customers, and phased in over multiple years . Generally, the maximum retail grid access charge for residential customers would be \$6 under Alternative C2 (EA 2.4.1). TVA evaluates local rate action requests based on three primary elements: cost basis, gradualism, and nondiscriminatory treatment.</p> <p>Using the method employed by the commenter to calculate the estimate of \$300 per year per household (apparently dividing the \$1.2 billion by the approximate number of residences in the TVA service area), an estimate of the maximum retail grid access charge per household per year would be \$156 (calculated as \$624 million divided by 4 million households). However, if an LPC requested such an extreme retail charge and such a request was approved by the retail rate review process established by the TVA Board, both of which are extremely unlikely, the charge would still be offset by a correspondingly dramatic decrease in retail energy rates. Under no foreseeable scenario would a residential customer be likely to experience a net increase of even one fourth of the magnitude suggested by CBD. The impact to residential bills of the proposal to reduce energy rates for wholesale standard service and to implement a monthly grid access charge would be zero under the</p>

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			<p>default rates, although individual customers might have bill impacts as high as \$2 per month depending on energy usage. The average impact to residential bills under the optional rates would be an average increase of approximately 0.3%. The impact to residential bills under customized rates developed by the LPC would depend on the structure proposed but would be subject to the retail rate review process.</p> <p>TVA's analysis in the EA shows that only a negligible change to energy use would result from implementing any of the rate change alternatives because the economic impact to customers would be minor. In fact, under Alternatives C1, C2, and D, TVA estimated a negligible <i>decrease</i> in energy use. In addition, TVA found that the economic effect would only marginally influence the rate of investment in DER among retail Valley consumers. Thus, TVA found that the proposal would not result in identifiable changes to air emissions or GHG emissions.</p>
116	Center for Biological Diversity	Because of the rate change - and the \$300 cost per household, DER decreases and reduced efficiencies - TVA must systematically and meaningfully analyze how much more fossil fuels likely will be burned as a result of the 2018 Rate Change. In addition to addressing conventional air pollutants, the agency must also then address the other costs associated with this result, according to well established metrics regarding the social cost of carbon and methane. TVA must evaluate the additional emissions associated with the 2018 Rate Change as compared to the baseline no action alternative, regardless of the direction of GHG emissions	As noted in a previous response, because the commenter's calculation of costs per household is inaccurate, its statements about the magnitude of environmental impacts associated with TVA's proposal are also inaccurate. The analysis in the EA shows that only a negligible change to energy use would result from implementing any of the rate change alternatives because the economic impact to customers would be minor. In fact, under Alternatives C1, C2, and D, TVA estimated a negligible decrease in energy use. In addition, TVA found that the economic effect would only marginally reduce the rate of investment in DER among retail Valley consumers.

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		<p>under that alternative.</p> <p>Given the impacts of increased greenhouse gas emissions and climate-change- driven superstorms, TVA must also consider the risks these increased emissions pose to TVA’s service territory, which is no stranger to such storms.</p> <p>Given how close we are to the tipping point where we can no longer forestall the worst impacts of climate change, it is vital that we undertake this renewable energy deployment as rapidly as possible. Yet, TVA’s 2018 Rate Change is expressly designed to delay—or more accurately, obstruct—this transition. Consequently, TVA must also evaluate the risks the 2018 Rate Change poses to the clean energy transition, and resulting risks it poses to exacerbating the direct and indirect impacts associated with climate change. As a corollary, TVA must also analyze the impact of increased demand of fossil fuel energy on constructing new fossil fuel plants to supply such demand, factoring in the environmental effects of such additional power plants that lock in TVA’s commitment to fossil fuel infrastructure for multiple decades—and the avoided benefits of transitioning away from fossil fuel plants.</p>	<p>Thus, TVA found that the proposal would not result in increased air pollutants or increased GHG emissions.</p>
117	Center for Biological Diversity	<p>TVA may not dismiss GHG indirect effects as simply too speculative or unquantifiable. Even if TVA cannot entirely “accurately” calculate the total emissions expected from the 2018 Rate Change, it must make appropriate estimates.</p>	<p>In section 3.1 of the EA, TVA explains its framework for conducting environmental impact analyses for rate changes. Therein, TVA notes that its analysis is partially based on the indirect responses by retail customers to decisions made by LPCs to TVA’s wholesale rates. This attenuation in the chain of causation specific to the</p>

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			<p>reviews of rate actions, makes it difficult to predict environmental impacts with precision. TVA also notes the difficulty in assessing impacts because the effects of the rate change on the physical environment depend on decisions made by intervening entities and consumers outside TVA's direct control.</p> <p>TVA does not dismiss GHG impacts as too speculative to discuss. Rather, TVA has determined that the proposed rate change would not result in any identifiable changes in GHG levels. TVA made this determination based on its assessment that the proposal would not result in changes to its operations, and would not require TVA to make any changes to its generation and transmission systems. Further, any change in customer behavior would be small based on our assessment that the proposal would only marginally influence the future growth of DER.</p>
118	L. Herrmann	By reducing the incentive for energy conservation, people will use more electricity and more air pollutants will be generated.	<p>In the EA, TVA addresses the potential that the rate change alternatives would increase electricity generation. In Section 3.4.2, TVA found that Alternative B (0.25¢) would not require TVA to change its operations or alter its generation and transmission systems, and that Alternatives C1 (0.5¢), C2 (1¢) and D (2.5¢) would result in a negligible decrease of 0.01 percent in energy use. TVA notes that other factors affecting TVA power supply requirements such as weather conditions and the level of economic activity are expected to have much larger influence on TVA energy production. Because of the degree of uncertainty regarding customer response and the expected minor magnitude of any such response, TVA</p>

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			would not alter its demand or energy requirements forecast as a result of proposed rate structure changes. Such negligible changes to TVA power generation would not result in an identifiable change in air emissions compared to current conditions, as explained in Section 3.5.2 of the EA (Air Resources).
119	State of Tennessee Department of Environment and Conservation	TDEC recommends TVA further evaluate GHG emissions from projected Electric Vehicles (EV) adoption in Valley. While adoption of EVs in the Valley has been slow to date, EVs are predicted to grow quickly starting in 2018-2019 due to the introduction of lower cost vehicles and shifting consumer preferences. By reducing energy rates under Alternative C, TVA may encourage faster adoption of EVs than under alternative A. While this may have positive effects on net overall GHG emissions, it may increase TVA's load and corresponding GHG emissions. Recent work by the Distributed Generation - Information Exchange (DG-IX) subcommittee for electric vehicles may be helpful.	TVA did not include an analysis regarding the potential effects of its proposal on the adoption of electric vehicles because such a discussion would be speculative. There remains great uncertainty regarding the extent to which electric vehicle adoption will grow in the TVA service area. And even assuming that some growth does occur in the adoption of electric vehicles in the foreseeable future, that growth is unlikely to change TVA's load to any significant extent. There are some general analytical assumptions, however, that help with the assessment of potential impacts of TVA's proposal, including price elasticity and assumptions on how LPCs may implement the proposal. TVA included analysis of the price elasticity of consumer usage related to the various components of the proposed rate change. See EA Tables 7, 8, and 9.
120	State of Tennessee Department of Environment and Conservation	Tables incorporated by reference from the Integrated Resource Plan should be shown.	TVA has added a hyperlink in the text of Section 3.5.1 to allow the reader to more quickly access the 2015 IRP EIS.
121	State of Tennessee Department of Environment and Conservation	On Page 39, TVA discusses the potential for greenhouse gas (GHG) emission impacts under the various alternatives. According to the analysis of Alternative C, "While an increased fixed cost may influence customers' investment in on-site energy (if LPCs elect to pass along	As presented in Chapter 3 of the EA, the proposed default retail rates would increase the cost of energy for the first 1,000 kWh each month. Under the proposed optional rates, the cost of energy would be increased an average of 0.3 percent. Neither of the two proposed retail rate

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		the rate change to customers), any change in customer use of the energy source would be so small that any associated changes in TVA power generation and any resulting ambient air pollution or GHG levels would not be identifiable (TVA assumes that any additional generation needs would be met by natural gas generation due to its low cost).” However, this analysis does not consider the potential for decreased uptake of energy efficiency in response to rate changes and the lower cost for higher electricity usage rates. TDEC recommends that TVA consider the full picture of DER, energy efficiency, and potential energy usage rates when assessing potential GHG emission changes under Alternative C.	structures is likely to increase the demand for electricity, influence customer investment in on-site generation more than marginally, or decrease the incentive for energy efficiency or conservation. Consequently, there are no identifiable impacts on GHG emissions as a result of the proposed rate change.
122	State of Tennessee Department of Environment and Conservation	TDEC recommends TVA further study and report on the impact of GHG emissions from increased DER, particularly solar, under all four alternatives. By reducing energy rates to dis-incentivize DER, TVA will limit or inhibit GHG-reducing projects including solar, CHP, and wind. While the Draft EA states that the resulting change would be “small” or “indiscernible”, no analysis is provided justifying this claim. Increasing interest in on-site generation coupled with rapidly declining costs for these projects could mean that a greater number of projects could be completed if TVA followed Alternative A, thereby reducing GHG emissions in the Valley. TDEC encourages that TVA include these considerations in the Final EA.	As noted in the EA, the expected effects on both usage and DER deployment are expected to be minimal under all the alternatives examined. Consequently, TVA estimates that there would be no changes to GHG emissions resulting from implementing the proposal.
123	Center for Biological Diversity	TVA must analyze the impacts of the increased fossil fuel emissions that will be engendered by the 2018 Rate Change on other environmental resources, such as water quality.	As explained in TVA’s response #115 above, CBD’s characterization of potential impacts of the proposal do not accurately reflect how the proposal would be implemented or the potential economic effects on residential customers (e.g., it is incorrect that each household in the Valley

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			<p>would incur \$300 of additional costs annually). As discussed by TVA in its analysis of the potential change to energy use from the proposed rate change alternatives, no increase to its power sales are anticipated from the rate action (see Table 5 of the EA). In fact, a negligible decrease in the expected energy use was calculated (-0.01%). Under any of the proposed rate change alternatives, TVA power forecasters determined that the proposal would not alter power generation in a noticeable way compared to its current operations. The environmental review did not indicate the potential for significant environmental impacts because of any change in operation of existing coal or gas generation, nor did the review indicate the need to build additional fossil generation capacity.</p>
124	Sierra Club/SELC	<p>It is plain that TVA's preferred alternative would increase environmental impacts above baseline conditions because it would encourage TVA to run existing coal or gas generation at higher rates or to purchase or build additional generation instead of relying on DER. Rate design can be used to shape customer usage—including total consumption and time of consumption—in a way that allows the utility to dispatch higher-efficiency or lower-efficiency generation resources, resulting in lower or higher emissions, respectively.</p>	<p>In the analysis of the potential change to energy use from Alternative C2 (preferred by TVA in the draft EA), TVA found that there would be no increase to its power sales (see Table 5 of the EA). In fact, a negligible decrease in the expected energy use was calculated (-0.01%). Alternative C1, TVA's preferred alternative in the final EA, would have the same negligible effect (Table 4).</p> <p>Under any of the alternatives, TVA power forecasters determined that the proposal would not alter power generation in a noticeable way above its current operations. The environmental review did not indicate the potential for significant environmental impacts because of any change in operation of existing coal or gas generation, nor did the review indicate the need to build additional</p>

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			fossil generation capacity.
125	A. Bush	The assessors came to precisely the wrong conclusion. In terms of overall energy usage, raising minimum monthly charges makes no sense. I, for one, intend to use enough electricity to meet the minimum charge because it's idiotic to pay for something I don't use. If the minimum charge goes up, expect my actual usage to go up accordingly. That way, TVA won't make any more money, but their costs will go up.	Under the proposal, TVA anticipates that a majority of a consumer's bill would continue to be based on volumetric energy charges; consumer bills will continue to be based primarily on usage. Customers would still be able to reduce their bills by reducing energy use or investing in energy efficiency, including appliances and solar generation.
126	A. McFarlen	The 12% rate hike proposed is excessive, and shows a disturbing lack of fiscal responsibility on the part of TVA, if in fact, this is the amount of deficit in the TVA budget. TVA has not disclosed the amount of financial deficit they are operating under (if any), which makes the proposed fee appear to be of benefit only to employees and shareholders at TVA and subsequently harm its customers. TVA has not sufficiently argued their case in favor of the fixed grid access fee, and therefore, is unacceptable, especially at the proposed 12% rate.	TVA is not proposing a rate hike or rate adjustment. The proposal would be revenue neutral to TVA. TVA regularly provides its financial reports for public review (see www.tva.gov under "Investor Relations"). TVA has revised section 1.1 of the EA to provide more information about the underlying need for the proposal.
VIII. NEPA PROCESS			
127	State of Tennessee Department of Environment and Conservation	TDEC recommends that TVA simplify the Executive Summary and add definitions of "DER", "average consumer" and "low usage" in the EA and Executive Summary. Also, under Section 1.2.1 ("TVA's Role in the Power Service Area and Current Relationship to Customers), TVA discusses Standard Service sales for TVA fiscal years 2013 through 2017. TDEC recommends	TVA has revised the Executive Summary to improve its clarity to the reader. Section 1.2.1 does not mention standard service sales. The section is intended to provide the reader with a description of TVA's wholesale rate structures over the past seven years. Publicly available sales and revenue data may be found in TVA's SEC filings at www.tva.gov under "Investor Relations."

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		TVA include hyperlinks or references within the Final EA to allow review of the supporting data on publically-available websites.	
128	Center for Biological Diversity	<p>It is also critical to recognize that, as TVA also reveals in the EA, the 2018 Rate Change is just the first in a series of additional mandatory fees that TVA intends to introduce in order to maintain its monopoly stranglehold on electricity generation. See EA at 45 (disclosing TVA's plans to add additional mandatory fees in the future). However, NEPA forbids TVA from segmenting its analysis of environmental impacts by dividing its plans into smaller pieces. Accordingly, TVA must disclose and address its entire plan for shifting to mandatory fees, and analyze the inevitable environmental impacts that will result as the agency continues to insure that there is limited growth in DER in TVA's service area.</p>	<p>TVA is not proposing to implement any additional rate changes other than the action analyzed in the EA. No specific future proposals are under consideration at this time. However, TVA addresses the potential for additional rate changes in the future in its discussion of cumulative impacts in the EA (section 3.10) because additional rate changes addressing cost recovery are reasonably foreseeable.</p> <p>As stated in section 3.10, should TVA implement additional rate changes in the future, the cumulative impacts of those changes may resemble the impacts analyzed in the review of Alternative D, which would implement a much greater fixed cost recovery than other alternatives and result in the greatest grid access charge and corresponding energy rate decrease. As noted above, TVA found very minor economic effects associated with implementation of Alternative D and found that there would be no or indiscernible environmental impacts.</p>
129	Memphis AARP Branch, Tennessee State Conference NAACP Environmental Justice Committee, Herman Morris, Appalachian Voices	TVA did not provide a sufficient period of time for the public to review the draft EA.	TVA made public announcements and provided the draft EA for review and comment due to the interest in the proposal. Consistent with its NEPA regulations and past practices, TVA provided 30 days for public input. The duration of the comment period as well as the format for public involvement (i.e. response through written comments) were selected to facilitate timely and

#	COMMENTS	COMMENT STATEMENT OR SUMMARY OF STATEMENTS	TVA RESPONSE
			meaningful public input and TVA received a high number of public comments during the comment period. The public was first made aware of TVA's proposal to change its rate structure last year. Since then, there have been opportunities for the public to express their views on the proposal, including at the TVA Board meeting and the listening session of the Regional Energy Resource Committee in November. This earlier input helped frame the discussion of relevant issues in the draft EA.
130	D. Royalty , N. Ottinger, J. Reid , J. Deal, T. Iovino, R. Phelps, R. Harris, T. Boughan, C. Barber, C.Schmidt, M. Gingerich, N. Beavers, J. Adams, B. Swinford, M. Stanfill, J. Mitchell, L. Ross, B. Wallace, K. Ferris, D. Thometz, B. Wallace, K. Singleton, N. Levison, H. Burris, B. Knisley, D. Harris, J. Noble, B. McCabe, P.L. Tobey, J. Brown-Hall, J. Jonakin, C. Drumright, R. Westbrooks, W. Goehl, J. Goehl, L. Williams, L. Charles, V. Alexiades, J. Steitz, P. Morello, B. Morello, G. Wade, L. Tift, M. Poley, A. Womac, C. Lane, B. Bowers	TVA should conduct an independent study on alternative rate designs while involving the public in that process.	TVA does not consider such a study to be necessary. TVA continues to work closely with over 150 local power companies, the Tennessee Valley Public Power Association (TVPPA), and the Tennessee Valley Industrial Committee (TVIC) to determine the appropriate rate structure. TVA's authority to set rates is described in Section 1.2.2 of the EA.
131	Center for Biological Diversity	As the foregoing discussion demonstrates, the 2018 Rate Change not only "may," but certainly will have significant environmental impacts, requiring as EIS. By discouraging DER development and energy conservation, and encouraging additional electricity use, the 2018 Rate Change will change consumer behavior, increase reliance on dirty fossil fuels, and cause all the adverse environmental impacts we have discussed above. For this	As explained in TVA's response #115, the commenter's characterization of potential impacts of the proposal do not accurately reflect how the proposal would be implemented or the potential economic effect to residential customers (e.g., it is not accurate the each household in the Valley would incur \$300 of additional costs annually). As provided in TVA's analysis of the potential change to energy use from the proposed rate change alternatives, no

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		reason alone TVA may not impose the 2018 Rate Change without first completing an EIS.	<p>increase to its power sales are anticipated from the rate action (see Table 5 of the EA). In fact, a negligible decrease in the expected energy use was calculated (-0.01%).</p> <p>Under any of the proposed rate change alternatives, TVA power forecasters determined that the proposal would not alter power generation in a noticeable way above its current operations. The environmental review did not indicate the potential for significant environmental impacts because of additional coal or gas generation, nor did the review indicate the need to build additional fossil generation capacity.</p>
132	Center for Biological Diversity	Precedent: TVA's unprecedented mandatory fees plainly establish a precedent with significant effects, mandating TVA complete an EIS (40 C.F.R. § 1508.27). For the first time, TVA is expending more than \$1 billion dollars of residential customer revenue and shifting it to mandatory fees that customers will pay regardless of their usage. Such an unprecedented, \$1.2 billion dollar change in TVA's pricing structure alone requires an EIS. The significance of this rate change as a groundbreaking precedent is further demonstrated by the fact that, as noted, TVA has made clear that this will be the first in a series of TVA moves toward mandatory fees in order to dissuade consumers from developing an interest in investing in rooftop solar. See EA at 45.	TVA's analysis of the rate change alternatives supports its determination that an EA is an appropriate level of NEPA review. In the EA, TVA found that none of the alternative rate changes would have significant impacts on the human environment. CEQ's regulations provide that agencies consider precedent-setting actions when evaluating the intensity of a potential impact, but those regulations also require that agencies give consideration to the potential for those future actions to result in significant effects. Here, TVA's assessment shows that there is no potential for significant effects. Further, rate change proposals such as this one are not necessarily precedent-setting in that TVA has implemented other rate changes that are revenue neutral. TVA's preferred alternative would move \$0.6 million from the standard service energy charges to the wholesale grid access charge, but remains revenue neutral.

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			<p>As noted in TVA's discussion of potential cumulative impacts (section 3.10), should TVA implement additional rate changes in the future, the cumulative impacts of those changes is most likely to resemble the impacts analyzed in the review of Alternative D, which would implement a much greater fixed cost recovery than other alternatives and result in the greatest grid access charge and corresponding energy rate decrease. TVA found minor economic effects associated with implementation of Alternative D and found that there would be no or indiscernible environmental impacts.</p> <p>TVA notes that the commenter is in error that the \$1.2 billion is revenue from residential customers. The revenue would also come from small commercial customers.</p>
133	Center for Biological Diversity	<p>Controversy: TVA's mandatory fees are highly controversial, also requiring TVA to complete an EIS ((40 C.F.R. § 1508.27). It is evident that the 2018 Rate Change is highly controversial, which separately triggers the requirement for an EIS. The enormous public outcry about TVA's proposal alone demonstrates this controversy. The controversy here – and need for a full-blown EIS – is further exacerbated by TVA's internally inconsistent arguments in the EA as to why it is proposing these mandatory charges and the impact they will have on consumers and the environment. Thus, as we have discussed, TVA claims that it is imposing these mandatory fees to address the fact that, in its view, consumers are being “over-incentivized” to install DER. EA at 1. However,</p>	<p>Consideration of the degree to which effects are controversial, under 40 CFR 1508.27(b)(4), refers to disagreement with respect to the characterization of the effects on the quality of the human environment, rather than whether a proposal is unpopular. TVA notes that of the almost 1,750 public submissions received during the review period, less than 10 included specific and substantive comments in response to TVA's analysis in the draft EA. TVA reviewed all comments regarding the potential impacts of the proposal and considered such input before finalizing the EA; responses to comments are addressed herein. TVA's analysis of the rate change alternatives was updated to incorporate some of the data provided by the public. The analysis supports our</p>

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		while that purpose will only be served if consumers actually change behavior due to new price signals, the 2018 EA avoids addressing environmental impacts associated with these mandatory fees based on the entirely contradictory rationale that, in fact, behavior will not change. EA at 29. This kind of controversy about what the actual, real world impacts will be from an agency proposal is precisely the kind of controversy and level of uncertainty for which the CEQ regulations require an EIS.	determination that an EA is an appropriate level of NEPA review because TVA found that none of the alternative rate actions would result in significant impacts on the human environment.
134	Center for Biological Diversity	Violation of Law: TVA's mandatory fees require TVA to complete an EIS because they threaten to violate TVA's statutory mandates in the TVA Act and guiding principles (to send pricing signals in order to provide appropriate customer incentives). (40 C.F.R. § 1508.27)	TVA addresses this in the responses (to comments 27, 28 and 29) regarding the consistency of the proposed rate change with the TVA Act of 1933, as amended.
135	Center for Biological Diversity	It is also critical to recognize that, as TVA also reveals in the EA, the 2018 Rate Change is just the first in a series of additional mandatory fees that TVA intends to introduce in order to maintain its monopoly stranglehold on electricity generation. See EA at 45 (disclosing TVA's plans to add additional mandatory fees in the future). However, NEPA forbids TVA from segmenting its analysis of environmental impacts by dividing its plans into smaller pieces. Accordingly, TVA must disclose and address its entire plan for shifting to mandatory fees, and analyze the inevitable environmental impacts that will result as the agency continues to insure that there is limited growth in DER in TVA's service area.	TVA is not proposing to implement any additional rate changes other than the action analyzed in the EA. Although no specific future proposals are under consideration at this time, TVA addresses the potential for additional rate changes in the future in its discussion of cumulative impacts in the EA (section 3.10) because additional rate changes addressing cost recovery are reasonably foreseeable. As stated in section 3.10, should TVA implement additional rate changes in the future, the cumulative impacts of those changes may resemble the impacts analyzed in the review of Alternative D, which would implement a much greater fixed cost recovery than other alternatives and result in the greatest grid access charge and corresponding energy rate decrease. As noted above, TVA found very minor economic effects associated with implementation of Alternative D and found that there would be no or indiscernible environmental impacts.

